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GOODYEAR AND THE HALL OF FAME.

CHARLES GOODYEAR discovered, invented, created vulcanized rubber. Thus simply stated, the fact seems very commonplace and of no paramount importance. It does not seem comparable with the work of Whitney and the Cotton Gin, Fulton and the Steamboat, Morse and the Telegraph, and others of the Immortals. Yet his accomplishment as far as originality goes far transcends them all. Not that it is intended to minimize the genius of the others or to decry the value of their work. But the case stands thus: Fulton applied an existing well-known principle successfully; Whitney made a machine do what had formerly been done by hand; Morse interpreted and applied known physical laws in electrical transmission. Goodyear on the other hand had no prepared basic knowledge from which to start: no text books contained a line of value; scientists and practical men could offer no assistance. Indeed, the thought that india rubber could be "changed" was to them the height of absurdity. Yet after thousands of experiments, covering years of time, he transferred a sticky, unreliable vegetable resin into a semi-metal that is to-day one of the world's most useful products. No other single human invention approaches it in strangeness. The transmutation of lead into gold would alone equal it in apparent impossibility.

From his discovery in the early 'forties has sprung an industry that is world-wide in scope. The production of the gum has given work to hundreds of thousands of natives in South America, Africa and Southern India. It has done more to clear up tropical jungles and to bring civilization and sanitation to the hot countries than has any other one industry. The hundreds of factories in the temperate zone, the millions of workmen and the billions of wealth thus created are in themselves a potent witness to the value of the Goodyear discovery.

Fortunately for individual manufacturers but unfortunately as far as general knowledge goes, vulcanization instead of founding one industry, produced nearly a score, all based solely upon vulcanization, but aside from that having little in common. To cite two examples, rubber footwear and insulated wire. They vary widely in machinery, processes, compounds, and markets. Manufacturers of the one commodity may not know that the other exists. And so it is with the rest of the lines of rubber manufacture.

To catalog even the varied products of vulcanized rubber would be an enormous task. Suffice it to say that it is a necessary factor in every industry, touches every profession and indeed every individual.

Hence it is wise and right that the request of Colonel Colt published elsewhere in these columns be endorsed by everyone in the rubber trade, and by every American. Charles Goodyear's name certainly belongs in the Hall of Fame.

AS TO PNEUMATICS FOR TRUCKS.

"AUTOMOTIVE INDUSTRIES" sounded a timely note of warning recently in an article entitled "Pneumatic Figures Needed," thus:

There is great need for authentic figures on pneumatic truck tire costs in different services. The claims made by different manufacturers vary widely. This is natural when it is considered that the figures are compiled from services operating under widely varying circumstances. The time has come, however, when definite conclusions should be drawn.

One manufacturer claims that on a ton-mile basis, the pneumatic will save 25 per cent on gasoline, 32 per cent on oil and 70 per cent on repairs. These figures were deduced from observations of trucks in service in Texas. It would be interesting to know how this checks with experiences in other parts of the country and some more or less concerted effort for getting down to hard facts on the pneumatic tire will be necessary before we have a clearly established idea of where they pay and where their serviceability is problematical.

It is very doubtful if the size of the truck has much to do with the matter, although there is doubtless a limit of truck size for which pneumatics are desirable. It is felt by many truck makers that the 1 to 1½-ton size should be practically universally equipped with pneumatics, and the 3½-ton size and over, rarely, if ever. It

is the sizes in between those from 1½ to 3½ tons capacity, which furnish the ground for debate. It is here that the purchaser must carefully weigh the conditions under which he will operate his trucks and make the decision. To help him reach his decision the manufacturer should equip his sales force with a mass of figures covering all phases of transportation, or the purchaser will be left very much at sea on a most important problem.

Furthermore, the matter is of the utmost importance to the truck manufacturer, because it will affect his design. If a large percentage of the trucks between 1½ and 3 tons capacity will require pneumatics, it is evident that new designs are required immediately, as tire manufacturers and others assert that there are few if any trucks in that capacity range really adapted to pneumatics.

The problem of design of a pneumatic-tired truck is altogether different from that of designing a vehicle for solids. Higher engine speeds and different gear reductions are necessary for these fleet freight carriers which are capable of 30 miles an hour and move across the relatively uninhabited sections of the country. It is with these vehicles that the ship-by-truck movement has been made a reality and considering the characteristics demanded of the truck the design reverts back very closely to passenger car practice in engine speeds and gear ratios.

A true picture of the situation will not be gained until we have complete statistics regarding costs in all the standard lines of transportation in which the trucks in the debatable class, between 1½ and 3½ tons, are used, and until recommendations made on the basis of observations of trucks in operation show what changes are desirable with the pneumatics. The invention of new rim types for the easy removal and replacement of the giant pneumatic, is a big step in rendering the large pneumatic truck more serviceable, but a collection of unbiased cost, speed and efficiency figures is needed to help the bewildered purchaser reach a positive conclusion before he selects his truck.

RUBBER RAINBOWS.

ACCORDING TO STATISTICIANS, ninety-nine and eight-tenths of those who own a few dollars are unable to retain them. They are rainbow chasers: gold, copper, oil, rubber, anything that sounds big. Just now it is rubber. New companies are floated overnight, or, a small company gets a letter of this sort:

> "The smaller companies cannot compete with the big ones. Why? Lack of capital. I can dispose of any amount of stock you may have to sell in thirty to ninety days. Please communicate at once," etc., etc.

Accompanying this is a chart headed, "Do you want $423,000 for $1,000," with the following figures:

> Goodrich, original investment of $1,000, is worth $696,000.
>
> Firestone, original investment of $1,000, is worth $150,000.

This of course is for the prospective investor, and it is unfortunately very effective.

Of course it is all true enough, that is, as far as the big companies named are concerned. It, however, does not take into consideration the long years of preparatory work before the original thousand was anything but a loss. No word of warning is given as to the necessity for building a solid foundation for the projected colossus. Nothing is hinted as to the need of experienced and brilliant managers, organizers and financiers. Nor does it enter into the head of the investor that the big boom is over, and from now on it is to be the steady grind of every-day, careful, cheese-paring business, with constantly decreasing profits. Not that the rubber business will not continue to grow and prosper. It will. But mushroom companies, no matter what their capitalization, are almost sure to come to grief, for the promoter is not trying for success, but simply for his commissions.

RUBBER LEADERS ON INDUSTRIAL RELATIONS.

THE INDUSTRIAL COMMITTEE of the Merchants' Association of New York of which Frederic G. Achelis of the American Hard Rubber Co., J. Newton Gunn, president of the United States Tire Co., and other rubber men are members, formulates the following excellent advice: "The recognition by both employers and employes that the determination to achieve national prosperity rather than to enforce maximum selfish returns, should be the controlling motive in industry. The community, as such, has a right to insist that industry be carried on in the interest of all citizens rather than for the sole benefit of those directly engaged in it. The permanent welfare of all citizens depends on national prosperity which is impossible unless there is maximum production at minimum 'per unit' cost without impairment either of proper living standards of employes or the ability of the employers to earn a reasonable return on their investment."

It is urged that a permanent method of conference between the employer and his employes be recognized with a definite arrangement—satisfactory to both employers and employes—whereby employes can collectively take up disputes or matters of common interest with employers. The following matters, it is declared, should be handled in such conferences: "Wages and working conditions including steps to promote continuous and permanent employment, especially in the case of introduction of new machinery and new processes; plant conditions affecting health and general welfare of the workers." A fair day's wage and continuous employment are urged as essentials to a harmonious understanding.

THE OLD-TIME MILL SETTLEMENT WAS AN AGGREGATION of barrack-tenements, squalid half-cottages and big jail-like factories. The factory village of to-day is made up of pleasant houses, gardens, parks, recreation grounds, club houses, hospitals, libraries, and factories where light, comfort, and health are prime requisites. Indeed, a new industrial project to-day begins with homes for the workers. In all of this transformation, the rubber trade has been a pioneer. It is claimed, furthermore, that no industry can show as large a proportion of well-to-do workers who own their homes. This in itself is the best possible insurance against unrest, strikes and soviets.

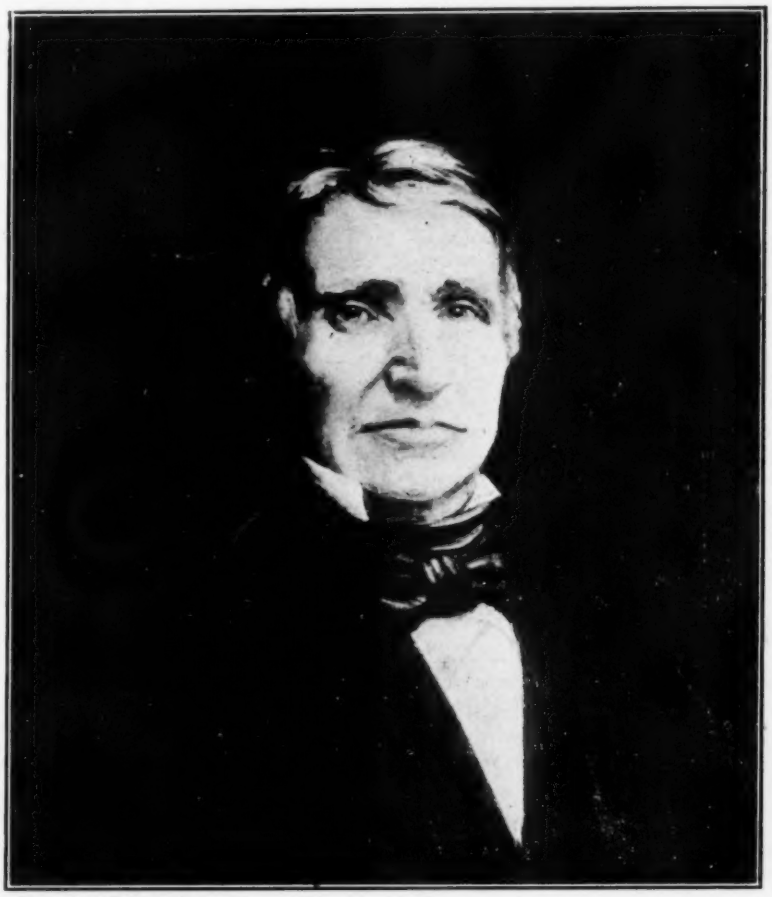
Charles Goodyear Nominated for the Hall of Fame.

AN EFFORT to secure a place in the Hall of Fame for Charles Goodyear will be made this year by leading figures in the rubber world. Elections take place every five years and 1920 is one of the years for making selections. Colonel Samuel P. Colt has already inaugurated a movement to bring the qualifications of Charles Goodyear to the attention of the one hundred electors who will vote on candidates, and as a first step, has written a letter of formal nomination to Robert Underwood Johnson, director of the Hall of Fame. In his letter Colonel Colt says:

"I wish to strongly urge the name of Charles Goodyear, the inventor of vulcanization of rubber. When we think of the many uses to which rubber is now put, adding greatly to the comfort of mankind, the alleviation of suffering, and the advancement of civilization, we are impressed with the fact that the world owes Charles Goodyear a debt of gratitude that can never be paid.

"All the improvements in the manufacture of rubber goods in general are based wholly upon Charles Goodyear's discovery of vulcanization — without air-brake hose, railway trains could not be properly run, without rubber tires we could not have automobiles or auto trucks and without rubber appliances we could not have the telephone, electric lights, airplanes nor the thousand and one other things in which rubber plays an important part.

"Of the eight rubber companies originally licensed under the patents of Charles Goodyear, three have gone out of business and the other five are now owned by the United States Rubber Co., which gives us a special interest in the great inventor."



(From an oil portrait.)

CHARLES GOODYEAR.

The claims of Charles Goodyear have been brought to the attention of electors at past elections in an unostentatious way, but rubber had not attained, even so late as the last election in 1915, the place of importance in American business it holds to-day. In 1914 the total production of rubber goods in the United States amounted to only $320,000,000. In 1918 the output was $1,122,000,000, nearly four times as great.

Goodyear's discovery of the vulcanization process is one of the romances of the history of invention. One of the reasons why he is especially entitled to recognition is that he understood clearly the importance of the results he was seeking to attain, and though by a mere accident he finally discovered the solution of his problem, it was not accidental that it was he who found the solution, for he had devoted his entire energy to the subject for years.

With a prescience that was uncanny, he forecast for rubber a future that even the development of the rubber industry in the past few years has not surpassed. He knew little about the electrical field, it is true, and nothing whatever about automobiles, yet his claims for patents made in the early forties show a vision for the future of rubber that was startlingly clear.

A man of strong religious tendencies, he felt himself under a divine impulse to carry to success experiments which would confer so great a boon on humanity. It was this feeling that led him, in spite of most precarious health and dire poverty, to continue for ten years his search for the elusive secret of how rubber might be made suitable for use.

As his experiments progressed, he not only manufactured rubber goods but even dressed in clothes made of rubber, wearing them for the purpose of testing their durability. He was certainly an odd figure and his appearance led one of his friends, who was asked how Mr. Goodyear might be recognized, to reply: "If you see a man with an india rubber coat on, india rubber shoes, an india rubber cap, and in his pocket an india rubber purse with not a cent in it, that is Goodyear."

His poverty was so extreme that many times only the kindness of friends and neighbors kept his large family from starvation. At that period imprisonment for debt was in vogue and on many occasions Goodyear found himself locked up for debt. He was regarded as a "crazy inventor," and, as time after time his hope that he had finally hit upon a solution of his problem proved illusory, his friends and relatives did not hesitate to tell him with much harshness that he should give up his experiments and find some means of supporting his family. But he persisted until he won complete success and then, instead of settling back and reaping a harvest from his discoveries, continued to spend the money that came to him, in adapting his discoveries to practical uses.

Though born in New Haven, Connecticut, Goodyear spent

much time in New York City and in various towns in Massachusetts. It was in Woburn in the latter state, when some rubber fell accidentally from his hand upon the top of a red hot stove, that he learned that the application of heat was the one additional element needed in the solution of the problem. So intimate was his acquaintance with his subject that the change produced in the rubber by its unexpected contact with the stove was recognized by him as of vital importance.

Large sums of money had been invested and lost in rubber manufacture before Goodyear brought his process to completion. Goods that looked all right were made up, but cold weather made them stiff and brittle, and in summer they became soft, and decomposition gave them an offensive odor.

Goodyear was born December 29, 1800. In 1834 he began his rubber experiments but it was not until the spring of 1839 that the stove incident occurred. His process was not fully perfected until 1844. He received the grand medal of the World's Exhibition at Paris, the Great Council medal of the Exhibition of All Nations at London, and the ribbon of the Legion of Honor from Napoleon III. He died at the old Fifth Avenue Hotel in New York in July, 1860. Death found him insolvent and his family heavily in debt. Though he made no fortune for himself, great wealth has come to many through his invention.

Seeing the Short Cuts.

By A Practical Man.

THERE is not one man in fifty who is either a trained or a natural observer. Moreover, the notion that observation comes naturally, like mastication or perspiration, is far from the truth. Some lack that quality of mind that constitutes the chief asset of the job analyst, while most men look but do not see. A great number are so close to their work that they lose the perspective. This explains in part the fact that the industrial engineer finds plenty of occupation for the ability required in his profession. The instances that follow came under the personal observation of the writer and tell of those who were convinced of a blind spot, and proceeded to cure it, much to their individual benefit and the credit of the rubber fraternity.

CONVEYOR CHUTES SAVE TIME.

A company in the Middle West engaged in the manufacture of bicycle tires employed a truck to gather the packages put up by the packers. This truck was pushed down a long aisle behind the men engaged in this work, where it gathered a load which was carried to the elevator located in the extreme end of the room; thence down one floor to the shipping department. This trucking was eliminated by cutting a hole in the floor about midway in the packing line and installing a chute, which delivered the packed goods by rapid transit.

A manufacturer of fabric shoes in the East, after inspecting the tops as they came from the sewing machines, paired them and placed them in small bags, which were then loaded upon a truck and delivered by the elevator to the next department, which happened to be immediately underneath. Here the bags were opened and the contents distributed. A chute from the inspection table to the floor below would have saved a lot of this work, and given almost instantaneous delivery.

An old and successful Eastern company had its mill room and calender rooms on one side of the lower floor, but with the engine room in between. To supply the calenders with material necessitated frequent trips by truck from the mill room. This trip was an irregular one, winding its way through several departments, by aisles always more or less congested, and by the time a round trip had been made the truck had traveled a distance of 760 feet. This trip was cut down to about 150 feet round-trip in the following way. A window in the mill room nearest the engine room was enlarged into a doorway, and a corresponding change made in the calender room. These two doors, therefore, opened to the outside, and in line with one another. A covered passage was then constructed connecting them, and better and quicker service at once resulted.

Another company had a battery of insulating machines on the second floor immediately over the calenders from which it received the supply of mixed stock. This particular process resulted in the rapid accumulation of large quantities of scrap, which was frequently returned by trucks to the calender room for rewarming, recalendering and return. A load of this scrap left the machines on a trip of 200 feet to the elevator, down the elevator 12 feet, thence to the warmers for the calenders, 200 feet more. This trip of 412 feet was cut out by the simple introduction of a chute from the vicinity of the insulating machines to the warming mills immediately underneath.

A trip of over 1,600 feet for a batch of Pará from the rubber cellar to the mixing mills would seem, with one company at least, a denial that "time is money." But such a situation came under the observation of the writer some years ago. From the point where the rubber was stored to the scales in the compound room where it was weighed, was 678 feet. The round-trip, therefore, for the trucker was 1,356 feet. From the scales to the breaking down mills was 140 feet, and from these mills back over the same track to the band saw where the rubber was cut and weighed into batches, was 140 feet more. Here it connected with the prepared compound and took a final trip of 50 feet to the mixers. It is a singular fact that directly under the compound room there was a cellar that could have been adapted to rubber storage and cut the initial round trip from 1,356 to less than 50 feet.

WORN MACHINERY A HINDRANCE.

Manufacturers of shoes find a machine for inserting eyelets a necessity. These machines are ingenious and complicated in the arrangement of parts. They are designed to insert any number of eyelets consecutively, the standard ranging from 4 to 11. The operator must have a thorough knowledge of the machine and the requirements in eyelets for each style and size of shoe. These eyelets must be so placed as to start at a point determined by the eye and be equally spaced over the limited surface allowed for the purpose. This spacing is designed to be controlled by a movable steel pin which engages in holes in a disk on which are stamped figures, ¼, ½, ¾, 1, etc. The pin inserted in any one of these should adjust the mechanism so that eyelets would be spaced the indicated distance apart. It chanced, however, in one factory, that none of the machines studied would perform the work according to specifications. The operators knew of no rule to govern the spacing and frequently lost time in trying to secure it. Conversation with the man who looked after these machines revealed the cause to be a worn out cam, which prevented proper alinement of the eyelets. The insertion of a new cam made the use of the pin and disk dependable.

UTILIZING SPACE.

A company engaged in the manufacture of mechanical goods had a commodious, well-lighted room around the sides of which 4-platen hydraulic presses were located. The center of this space, 15 by 20 feet, was occupied by stock and tables on which were placed the vulcanized articles consisting largely of valves, heels, horse-shoe pads, etc. For years these had been gathered

in box trucks and toted to an adjoining room 75 feet distant, where they were trimmed by girls and inspected. This toting was obviously waste motion and was corrected by building in front of the battery of presses, benches arranged in the form of a square, the interior of which was immediately occupied by the trimmers and their equipment.

SYSTEM IN MILLING RUBBER.

There is a variety of practice in breaking down rubber and mixing compounds. In some lines of manufacture five or six hours is not regarded as excessive to break down Pará, while in other very divergent methods, considerably less than one hour is considered sufficient. Then, apparently of necessity, some compounded batches require a much longer time for mixing than others. Time on the mill is often a point in dispute, and there should be some intelligent method to control it. If you are convinced that the same mill should be used for warming up rubber and mixing, the chances are you are not very keen over a few extra minutes that may be taken by workmen who are not controlled by written standard practice.

A very satisfactory method will be followed in the use of two mills by one man who warms up gum on one while mixing a batch on the other. A mill, say 16 by 42, with a speed of 14 and 18 r.p.m. can mix a compounded batch of 100 to 125 pounds in five or six minutes. This would necessitate, probably, a mill equipped with a mixing apron, for the value of such an attachment can be easily demonstrated. Under this method, five or six minutes is sufficient time to incorporate the compound in the rubber, and the batch should be immediately cut off the mill. This commonplace act of cutting-off can be made a time-waster, for the number of cuts should be a matter of standard. For example, one stroke of the knife across the face of the roll and the batch drops from the mill—a matter of seconds—but the average mill hand will take off a batch of this size in six or more cuts. In many cases batches go from the mixer to the refiner, or ready for the cooling shelves. In either case, the batch should not be rolled up as it is cut from the mill, but should be handled in slab form, the point of value being to get the finished batch off and a new one on, with the fewest motions possible. It is clear that the operations of refining and warming up are really continuations of the process of mixing, hence saving time on rough mixing is good practice.

A SECOND FLOOR FOR STORAGE.

In many rubber factories the compounding room has a minimum of equipment and maximum of discomfort, and good ventilation is not one of its virtues. As a rule, it is on the main factory floor near the mill room and looks like Satan's back yard. Materials are handled in the original package and the space is cluttered with boxes, barrels, casks, carboys and bags. Labor-saving devices get paralysis before crossing the threshold, and the superintendent who is indifferent to such a condition must have a well-developed blind spot. Taking into account the real efficiency of the average man when provided with proper equipment to handle a job, it is singular that anyone should apparently fail to see the waste of time when a man has to d'g up things out of barrels and casks, the work steadily taking longer and becoming physically harder the deeper he goes into a container that must of necessity be emptied. Just because this material is in bulk and heavy is no reason why it should not be handled efficiently. There is at least one way in which this can be done, namely, to introduce the use of chutes or conveyors. This means a second floor for storage of compounds, and extending to the floor below, a chute for each ingredient, whence the quantities required can be drawn and weighed. With storage room equipped for handling bulk packages by power, the filling of chutes, which should have capacity from a barrel to a ton, would be a simple matter. If any compounds require drying or sifting, apparatus for this purpose should be provided on the second floor. This method accomplishes two things. It clears the air on the main floor of dust and permits weighing of materials with rapidity. Where, under the old way, "comp" had to be laboriously shoveled from barrels and taken to the scale, in the new way the scale and weighing hopper, moved on a track are run underneath the chutes which are opened as required.

EXPERT WORKERS.

Industrial engineers have always advocated training a workman so that he could perform his task in the most efficient way. This is not always done, with the inevitable result of lowering the quality of performance throughout the shop. The best factories are those that maintain a high standard of excellence, and if a man wishes permanent employment he is compelled to answer affirmatively the question, "Are you a high-class man?" There are some machines used in rubber manufacture that call for a high degree of skill. Those used for cutting out soles for footwear are in this class. It is an easy machine to operate, a light pressure and removal of the foot starting and stopping it. But the job calls for a nice adjustment of the man to the machine, a sort of nervo-physical balance. It is one thing to have a man operate this machine as though he were shoving pig-iron into a furnace, and another to have a man who has a hair-trigger control of every muscle and pushes the rubber slab and cut soles in rhythmic sequence with the rhythm of the machine. The results are readily discernible. The man who thinks of pig-iron when handling a rubber slab across the cutting plate and tries to break through the floor when he presses the treadle cuts 1,800 to 2,500 soles; the other type of man 3,500 to 5,000. Take each of these men at his minimum as an average and you have for 30 days 54,000 and 105,000 respectively.

One way to make a man an expert workman is to impress him with the importance of maximum production. If he is operating a sole-cutting machine and he has to stop it to sharpen a knife or adjust an ill-fitting part or to get stock or wait for his helper, he will soon get a wrong slant at the main idea. It is a losing proposition that works both ways.

THE FOREMAN SHOULD BE CENTRALLY LOCATED.

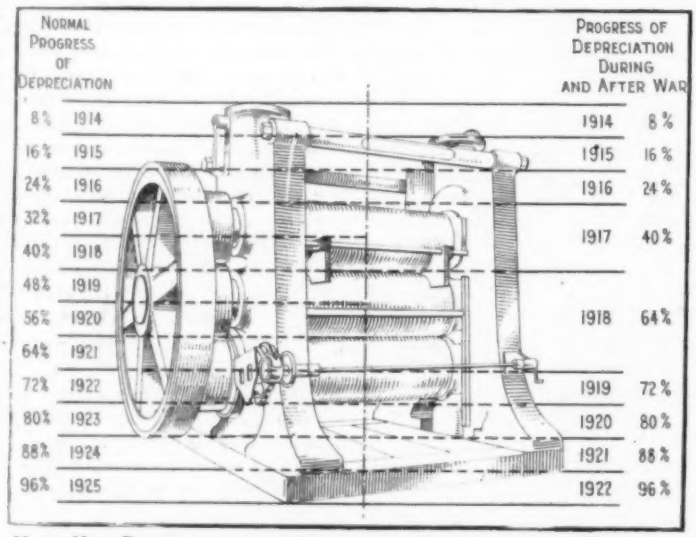
In the layout and equipment of a factory department the location of the foreman's office, as a rule, receives scant attention, with the result that it is frequently located at one end of the room farthest removed from the larger number of workmen. In one case, in the milling department of a rubber factory, one corner of the room was used for putting up compounding materials. This room was walled in to prevent the spread of dust and a portion of it, a space 3 by 10 feet against a window, was used by the foreman as his office for the clerical work he had to do. There were in this department 40 mixing mills, a calender, four washers and large drying rooms, so it was sizable enough to require constant supervision. The point I wish to make is, that the foreman's office or desk should be so located that his men will be under his eye at all times. When this principle was emphasized to the superintendent of the mill in question, his eyes were opened to the desirability of having a change made. Opening out of the mill room about midway in its length was a small store room. A section of the wall between was removed and windows substituted in the form of a bay projecting slightly into the mill room. The floor of the new office was placed three feet above the mill room level, and from this point of vantage all operations were under constant observation.

This same factory had its vulcanizers on the ground floor. The bulk of its product was produced on the second floor and had to be lowered by an elevator for curing, and hoisted afterward for inspecting and finishing. This extravagant waste of time and travel had been going on for years, the management being apparently "stone blind" to the loss incurred. A new superintendent caused the vulcanizers to be raised to the level of the second floor.

The Rapid Rise in the Cost of Equipment—An Important Factor in Rubber Production Cost Accounting.

By L. W. Alwyn-Schmidt, Consulting Economist.

THE RECENT INCREASES in the cost of all industrial equipment is bound to play an important part in the cost accounting policies of our rubber factories during the present year, and others to come. There is hardly a unit of equipment that has not been touched by this rise. Industrial machinery has gone up at the rate of one to two hundred per cent, building expenditures are up at least 150 per cent, and the great range of industrial supplementary equipment, part of which is a product of the rubber industry as belting, has seen advances of at least 100 per cent during the last few years. These advances in the cost of equipment, although well known to all manufacturers in the rubber industry, nevertheless seem not to have made a permanent impression upon the minds of the financial experts of this industry. Hardly any precautions have been undertaken to meet the situation and the majority of rubber factories are still estimating manufacturing cost upon a basis of machine depreciation much below that which is required by actual conditions. The loss naturally falls upon the shoulders of the rubber industry. But, in addition, there is the very real danger of the industry weakening its financial position in such manner as to court unavoidable disaster if steps are not taken to correct the situation.



HAVE YOU PROVIDED FOR THE ACCELERATED DEPRECIATION OF MACHINERY EQUIPMENT CAUSED BY FORCED EMPLOYMENT DURING THE WAR?

EXISTING CONDITIONS.

The condition as existing to-day is best explained by an assumed example of a rubber factory having a machinery equipment costing $200,000 during the year 1914. If this factory is operated upon the general practice of charging 8 per cent to the depreciation fund every year, it has to add to its annual manufacturing expenditure $16,000, which amount would have to be set aside for purpose of renewing the equipment after it has become unsuitable for the purposes of the enterprise. Experience has shown this policy a very sound one in normal times, and allowing 10 years' life to the machinery equipment, a provision of 8 per cent for depreciation would amply cover this factory against loss from this account. It is, therefore, employed without any criticism, and no fault could be found as long as depreciation really proceeded at the rate of 8 per cent and also as long as the price of the equipment remains approximately the same. Both essential conditions for the safe operation of the 8 per cent equal depreciation rule do not work to-day.

The war has changed the fundamental industrial conditions and the rubber factory under consideration has, most likely, not only experienced a more rapid rate of equipment depreciation than that indicated by a depreciation charge of 8 per cent, but it also can not hope by any means to purchase its equipment at the end of the customary ten years—the year 1924—at the same purchase price of 1914. It is fairly certain that the equipment in question will lose its manufacturing effectiveness considerably earlier and that it will cost approximately $400,000 to replace it when this time has come. This factory then has to show at the best only a repurchase fund of $200,000 allowing for accumulated interest of investment, and it will have to find additional funds to put the factory back upon the same basis of efficiency that it had during 1914. The factory has lost a matter of $200,000 in ten years of operation or $20,000 per annum. Incidentally, it has also charged $20,000 every year below its actual manufacturing cost.

Such a loss would be a heavy one in any industry; it is, however, especially dangerous in the case of the rubber industry where competition is very active and where in consequence there is a strong tendency of shading prices. During the war, of course, considerable profits have been made by many rubber factories, but it is doubtful whether a sufficient amount of these profits has been set aside for reserves above the usual depreciation fund in every instance. The chances in fact are that profits have been divided more lavishly than usual, considering the need of the shareholder for larger earnings in view of the high cost of living and the general increasing personal expenditure.

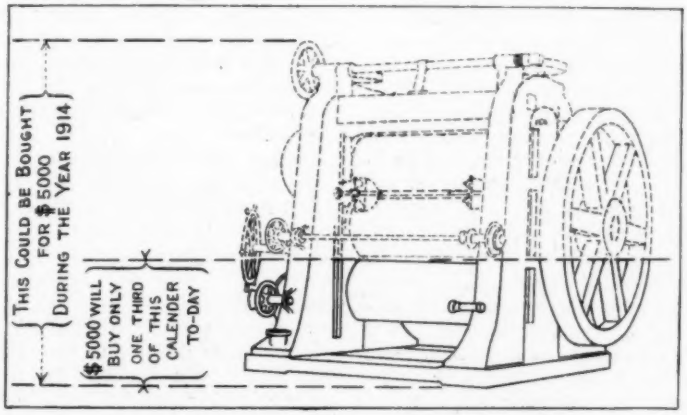
The danger now is that the rubber factories will go to the other extreme and after having made big profits for a few years will try to cut their profits lower than it is safe for the profitable operation of their enterprises, in an endeavor to meet growing competition and a possible decline in the volume of orders. With such a possibility in view, it is essential that the industry should know its working cost to the fraction of a cent and that no miscalculation should be made, as might easily occur if the present practice of charging depreciation cost is continued.

A CHANGE OF ATTITUDE RECOMMENDED.

A new method of charging depreciation, therefore, seems to be urgently required. Such a method to be really useful must not be too complicated, and it must fit every condition so that it can be employed uniformly. The principle in the development of such a method must be a complete change in the attitude of our accountants and factory owners with respect to the depreciation factor in the annual account sheet. The general feeling towards the depreciation charge is to-day one of gentle leniency. To charge depreciation upon equipment permits the factory to make less profits in the eye of the taxation officer; incidentally, the slow writing off of the equipment provides the

accountant with the pleasant feeling that he really strengthens the financial position of his firm. Having followed a safe course for so many years, there is little reason to suspect its unsoundness until actual disaster overcomes the enterprise. The process of attrition proceeds slowly; the danger as a rule is not noticed until it is too late to make amends, and the firm simply goes to sleep as so many others do, after having run through an apparently prosperous existence of 15 to 18 years, the time that is required to make the equipment industrially incompetitive.

Substitute for the word depreciation the word replacement, and an entirely new atmosphere is created. The words replacement fund do not only suggest the recording of the progress of loss of effectiveness in machine depreciation as a matter of routine, but replaces it by an actual payment from the profits of the enterprise as an offset against this loss. A purely theoretical problem becomes suddenly very much alive. Depreciation and loss of effectiveness become tangible meanings, and while opinions may differ about the amount that will have to be written off, it will give the factory its full safety for continued prosperity. Further, if the money is taken actually from the profits there is *prima facie* evidence of the annual cost of depreciation to the factory, and the influence of the depreciation charge upon manufacturing cost is not so easily overlooked. The equipment replacement fund becomes a very effective safety valve, protecting the factory not only against slow depreciation, but giving it the means for making occasional equipment improvements.



IS YOUR EQUIPMENT REPURCHASE FUND SUFFICIENT TO PROTECT YOU AGAINST THE RISE IN COST OF RUBBER MACHINERY?

A number of systems have been proposed to make the depreciation charge more fitting to actual conditions and to bring the depreciation factor into more immediate bearing upon the cost estimating policy of the firm. The following system may appeal to most rubber manufacturers because it can be easily employed over a great variety of equipment, and because it can easily be used for the purpose of checking depreciation cost in the different subdivisions of a large manufacturing concern. The system is based upon the principle of making the depreciation charge upon the rate of actual employment, and to charge upon the real replacement value of the equipment.

HOW THE METHOD SHOULD BE EMPLOYED.

To explain the system it may be best to return again to the original example of a rubber factory with a machinery equipment costing $200,000 during the year 1914. The year 1917 may be used for the purposes of demonstrating the method. This year belonged to the most strenuous years in the war history of the rubber industry. It required an enormous expansion of all production in support of the army equipment industries, and most factories worked overtime all through the year. It does not matter here what the actual rate of employment of our factories was. We may assume, however, that the factory under consideration has worked with three shifts during the second six months of the year, having worked upon a normal production of eight hours during the first half only. Assuming that experience has shown the rate of 8 per cent as approximately correct for the purpose of making a depreciation charge under normal occupation of the equipment, it must be taken for granted that for the first half-year depreciation has normally developed upon the indicated level. From the beginning of July, however, the factory has changed its working policy. It has worked 24 hours a day and equipment has been in use, not the customary eight hours, but three times that period. Depreciation, therefore, has proceeded not at the rate of 8 per cent per day, but at 24 per cent. Loss of industrial effectiveness of the equipment under such conditions would not have been reached after ten years, approximately, but at a time slightly over three years and four months. In fact the equipment would have required renewal during the present year, allowing for a normal depreciation during the years 1914 to 1917. The depreciation of the equipment in this factory, therefore, proceeded at an average of 16 per cent for the whole year, and was less effective industrially than the preceding year when the time came for drawing the annual balance.

Having established in this way the factor of depreciation, it is neccessary to inquire into the value of the equipment to the factory. If the works had burned down suddenly or otherwise been destroyed, by the end of 1917 the equipment could not have been replaced for the $200,000 at which it stood on the books; $300,000 at least would have been needed for that purpose. This also would have been the amount obtained by making a complete valuation of all the equipment of the factory at the existing replacement value. The cost of depreciation of equipment in that factory, therefore, was during the year 1917 as follows:

Six months employment of equipment at 8 hours a day.
Rate of depreciation, 8 per cent.
Six months employment of equipment at 24 hours a day.
Rate of depreciation, 24 per cent.
Average annual depreciation of equipment, 16 per cent.
Replacement cost of equipment to date, $300,000.
Total charge to depreciation cost, $48,000.

The annual charge under the old method would have been $16,000, a loss to the factory of $32,000 in operation cost, if not taken care of in the charge to manufacturing cost.

SHOWING ADVANTAGE OF NEW METHOD.

But the proof of the pudding is in the eating. Does this system really guard a factory against both the increasing speed of depreciation incurred by increased production and also against the increasing price of the equipment? Let us suppose that equipment prices would have remained approximately the same at the end of 1918 and that this factory also has continued to work at the rate of 24 hours during 1918, with the certainty of having to replace its total equipment somewhere near the end of 1920. We would then have the years 1914, 1915 and 1916 as normal years, with equipment prices remaining approximately at the level of 1914 and employment at 8 hours per day. During three years the factory would then have charged a level 8 per cent of depreciation, and it would have had in hand a repurchase fund of $48,000 plus interest and an equipment still worth approximately seven years' effective employment. The next year 1917 would have added $48,000 to the fund, while 1918 would provide $72,000. By the end of 1918 two years of effectiveness might still be left, and dur-

ing these years $48,000 would have been added to the repurchase fund, assuming in this instance that further increases in the price of the equipment would not have made necessary additional provision for depreciation.

Allowing for accumulated interest from the investment of the annual addition to the repurchase fund, a total amount of $270,000 would then be on hand at the end of 1920. This is still $30,000 short of the actual value of the equipment, but it must be taken into consideration that this equipment has still some value which makes it a marketable property and $30,000 may easily be obtained by selling such equipment, unless the factory decides to use it a few years more on work where less effectiveness and precision is required. Another five years of employment in secondary mauufacturing processes probably would make the equipment obsolete for use in high-class manufacturing, and its sale then would become a necessity. In the meantime, however, its value would have been wiped off completely from the balance sheet of the enterprise, as only another year and a quarter would be required to provide for the additional $30,000.

INFLUENCE UPON COST OF PRODUCTION.

Mention already has been made several times of the effect of such a policy upon the cost accounting practice of a rubber factory. It is obvious that the former policy of charging depreciation upon the original investment on a basis of an equal depreciation rate is giving a wrong impression of the actual cost of the equipment upon manufacturing cost. There is considerable difference if a charge sheet is made upon an overhead charge of $16,000 for machinery depreciation or upon one of $24,000 for instance. But the higher charge is not only justified by conditions but also by the urgent necessity of the present price situation.

All manufacturing, after all, is service rendered in the interest of the buyer. That the manufacturer buys to-day the raw materials and also takes care of the distribution of the article that is manufactured in his plant, does not alter anything in this very fundamental rule of cost accounting. If this manufacturer employs expensive tools in serving his trade the customer must pay his share of the wear and tear of the tools or he must seek out another manufacturer having a less expensive equipment. Let the wear and tear proceed at a quicker pace than normally accepted while the work is done for the customer, and it is only just that the customer also should stand for the increased rate of use. On the other hand, however, three times the rate of the employment also means, most likely, three times the quantity of goods. The increased rate of wear and tear, therefore, spreads over a larger production, and the relative share of each unit of production upon the increased wear and tear of the equipment remains practically the same. This, however, does not apply in the same manner to the increased cost of the equipment. If to replace the unit of equipment costs double what it cost to buy in the past, this increase doubles also in its relationship to each unit of production. Assuming, therefore, a factory employs its equipment at three times the rate of normal, producing also three times as much goods while the equipment price remains the same, there would also be no increase in the cost of manufacture of the individual unit of production. If the cost of the equipment, however, would be double the cost of manufacture of the individual unit of production, its cost will increase at exactly its share of the increased cost of purchasing the equipment.

This is a rule that rubber manufacturers will have to keep in mind when making up their cost charges during the future. Its application will be made more easy if they follow the practice of charging depreciation costs as outlined in this article. With the help of the time books it will be possible to allocate depreciation cost quite correctly to each article manufactured in the factory, whether the process of manufacturing is carried on in one or in several departments.

PRODUCTION, NOT SELLING, IS THE PROBLEM.

By Colonel Samuel P. Colt.

THE OUTLOOK for the year 1920 in the rubber industry is most flattering. To-day the demand for all lines of rubber goods exceeds the supply. It is not a question of selling goods. It is a question of producing them. In other words, if we could turn out 50 per cent more production than we are able to do with our present manufacturing facilities, the entire output would be disposed of without difficulty. The year 1919 has been the banner year in the rubber manufacturing business. At the time of the armistice it was our opinion that with the virtual closing of the great war and the stopping of government orders there would necessarily be a falling off in the volume of sales of rubber goods, but such has not proved to be the case.

While all lines of rubber goods, such as footwear, mechanical goods, druggists' sundries, etc., show an increase, the most marked development has been in the tire industry. The large tire manufacturers have been unable to supply the demand for tires the past year. In 1914 there were registered in this country 1,574,433 automobiles, and 136,907 automobile trucks. It is now estimated that there are in use 6,800,000 automobiles and 800,000 automobile trucks—a remarkable increase.

When the question is asked, "What is the matter with our trolleys?" I would reply that the fundamental difficulty is the encroachment thereon of the automobile and the automobile truck, and with the improvement and development of our highways, I can see no room for trolley lines along sparsely populated sections. My opinion is that the tracks of many suburban trolley lines will eventually be taken up. Therefore, while the development of the rubber tire has been tremendous during the past five years, there is every reason to believe that it is to-day, comparatively speaking, in its infancy. The effect of the development of the pneumatic tire upon both passenger and freight traffic, or in other words upon our railroads, has, I am convinced, not yet been realized.

The price of crude rubber has been normal during the year, having averaged about 45 cents per pound. It is estimated that 70 per cent of the crude rubber consumption of the world in 1919 was by American manufacturers. With the opening up of Europe, one might look for some increase there, but I would predict that the United States will continue to consume more than half the world's crude rubber product for years to come. We plainly lead the world in rubber manufacturing. Prices of fabrics entering into tires and other rubber goods have ranged higher in 1919 than ever before, the indications being that we have not yet seen the limit of high prices.

The development of plantation rubber in the East has continued unabated. It is most fortunate for the rubber industry that the cultivation of the rubber tree in the vast regions of the East proved practicable, for had we to depend upon the wild rubber of Brazil and other sections, the supply would be so inadequate and the price so exhorbitant that it is difficult to see how the tire industry could have reached its present stage of development, to say nothing of the future.

It is plainly evident that the result of the phenomenal depreciation in foreign exchange has been to curtail American exports. However, with the opening up of Europe our rubber export trade has increased to such an extent that it is now larger in volume than before the war. Moreover, with a permanent change for the better in the foreign exchange situation, which is expected to follow the ratification of the peace treaty, it is only reasonable to assume that our European trade in rubber goods will assume proportions of greater magnitude than heretofore known.

Standard American Export Practice.

AS THE CERTAIN MEANS of insuring unmistakable clarity in terms and conditions of sale, nine of the greatest commercial organizations of the United States interested in foreign trade have in conference adopted a simplified standard American export practice that should greatly facilitate and promote the foreign business of this country. The organizations party to the program are the National Foreign Trade Council, Chamber of Commerce of the United States of America, National Association of Manufacturers, American Manufacturers' Export Association, Philadelphia Commercial Museum, American Exporters' and Importers' Association, Chamber of Commerce of the State of New York, New York Produce Exchange and New York Merchants' Association. The program itself consists of a statement of definitions of the abbreviated forms of price quotations in more or less common and general use in the export trade, which manufacturers and exporters are urged to use habitually as far as possible to the exclusion of other forms synonymous or otherwise; also the recommendation that all use of abbreviated forms be abandoned and that the terms be written out in full.

Manufacturers and exporters are urged to bear in mind that the confusion and controversies which have arisen in American export trade have sprung in part from the use of an excessive number of abbreviated forms with substantially similar meanings, as well as from the use of abbreviations in a sense different from their original meanings, or in an application not originally given them and different from the sense or application understood by foreign buyers. In the simplified and standardized practice agreed upon lies the best hope of reducing confusion and avoiding controversy.

As the most effective measure of simplification, the general practice of quoting for export, as far as possible, either "F. A. S. Vessel," "F. O. B. Vessel" or "C. I. F." is strongly recommended. All of these terms are readily understood abroad and difficult of misinterpretation, and concentration on this small list, it is felt, will be markedly influential in avoiding misunderstanding and disputes.

DEFINITIONS OF EXPORT QUOTATIONS.

The following are, in their order, the normal situations under which an export manufacturer or shipper may desire to quote prices. It is understood that unless a particular carrier is specified by the buyer, the goods will be delivered to the carrier most conveniently located to the shipper.

1. When the price quoted applies only to an inland shipping point and the seller merely undertakes to load the goods on or in the cars or lighters furnished by the railroad company serving the industry, without other designation as to routing, the proper term is:

"F. O. B. (named point)."

Under this quotation:

A. Seller must—
   (1) Place goods on or in cars or lighters.
   (2) Secure railroad bill of lading.
   (3) Be responsible for loss and/or damage until goods have been placed in or on cars or lighters at forwarding point, and clean bill of lading has been furnished by the railroad company.

B. Buyer must—
   (1) Be responsible for loss and/or damage incurred thereafter.
   (2) Pay all transportation charges including taxes, if any.
   (3) Handle all subsequent movement of the goods.

2. When the seller quotes a price including transportation charges to the port of exportation without assuming responsibility for the goods after obtaining a clean bill of lading at point of origin, the proper term is:

"F. O. B. (named point) FREIGHT PREPAID TO (named point on the seaboard)."

Under this quotation:

A. Seller must—
   (1) Place goods on/or in cars or lighters.
   (2) Secure railroad bill of lading.
   (3) Pay freight to named port.
   (4) Be responsible for loss and/or damage until goods have been placed in or on cars or lighters at forwarding point, and clean bill of lading has been furnished by the railroad company.

B. Buyer must—
   (1) Be responsible for loss and/or damage incurred thereafter.
   (2) Handle all subsequent movement of the goods.
   (3) Unload goods from cars.
   (4) Transport goods to vessels.
   (5) Pay all demurrage and/or storage charges.
   (6) Arrange for storage in warehouse or on wharf where necessary.

3. Where the seller wishes to quote a price, from which the buyer may deduct the cost of transportation to a given point on the seaboard, without the seller assuming responsibility for the goods after obtaining a clean bill of lading at point of origin, the proper term is:

"F. O. B. (named point) FREIGHT ALLOWED TO (named point on the seaboard)."

Under this quotation:

A. Seller must—
   (1) Place goods on or in cars or lighters.
   (2) Secure railroad bill of lading.
   (3) Be responsible for loss and/or damage until goods have been placed in or on cars or lighters at forwarding point, and clean bill of lading has been furnished by the railroad company.

B. Buyer must—
   (1) Be responsible for loss and/or damage incurred thereafter.
   (2) Pay all transportation charges (buyer is then entitled to deduct from the amount of the invoice the freight paid from primary point to named port).
   (3) Handle all subsequent movement of the goods.
   (4) Unload goods from cars.
   (5) Transport goods to vessel.
   (6) Pay all demurrage and/or storage charges.
   (7) Arrange for storage in warehouse or on wharf where necessary.

4. The seller may desire to quote a price covering the transportation of the goods to seaboard, assuming responsibility for loss and/or damage up to that point. In this case, the proper term is:

"F. O. B. Cars (named point on seaboard)."

Under this quotation:

A. Seller must—
   (1) Place goods on or in cars.
   (2) Secure railroad bill of lading.
   (3) Pay all freight charges from forwarding point to port on seaboard.
   (4) Be responsible for loss and/or damage until goods have arrived in or on cars at the named port.

B. Buyer must—
(1) Be responsible for loss and/or damage incurred thereafter.
(2) Unload goods from cars.
(3) Handle all subsequent movement of the goods.
(4) Transport goods to vessel.
(5) Pay all demurrage and/or storage charges.
(6) Arrange for storage in warehouse or on wharf where necessary.

5. It may be that the goods, on which a price is quoted covering the transportation of the goods to the seaboard, constitute less than a carload lot. In this case, the proper term is:
"F. O. B. Cars (named port) L. C. L."

Under this quotation:

A. Seller must—
(1) Deliver goods to the initial carrier.
(2) Secure railroad bill of lading.
(3) Pay all freight charges from forwarding point to port on seaboard.
(4) Be responsible for loss and/or damage until goods have arrived on cars at the named port.

B. Buyer must—
(1) Be responsible for loss and/or damage incurred thereafter.
(2) Handle all subsequent movement of the goods.
(3) Accept goods from the carrier.
(4) Transport goods to vessel.
(5) Pay all storage charges.
(6) Arrange for storage in warehouse or on wharf where necessary.

6. Seller may quote a price which will include the expense of transportation of the goods by rail to the seaboard, including lighterage. In this case, the proper term is:
"F. O. B. Cars (named port) LIGHTERAGE FREE."

Under this quotation:

A. Seller must—
(1) Place goods on or in cars.
(2) Secure railroad bill of lading.
(3) Pay all transportation charges to, including lighterage at, the port named.
(4) Be responsible for loss and/or damage until goods have arrived on cars at the named port.

B. Buyer must—
(1) Be responsible for loss and/or damage incurred thereafter.
(2) Handle all subsequent movement of the goods.
(3) Take out the insurance necessary to the safety of the goods after arrival on the cars.
(4) Pay the cost of hoisting goods into vessel where weight of goods is too great for ship's tackle.
(5) Pay all demurrage and other charges, except lighterage charges.

7. The seller may desire to quote a price covering delivery of the goods alongside overseas vessel and within reach of its loading tackle. In this case, the proper term is:
"F. A. S. vessel (named port)."

Under this quotation:

A. Seller must—
(1) Transport goods to seaboard.
(2) Store goods in warehouse or on wharf if necessary, unless buyer's obligation includes provision of shipping facilities.
(3) Place goods alongside vessel either in a lighter or on the wharf.
(4) Be responsible for loss and/or damage until goods have been delivered alongside the ship or on wharf.

B. Buyer must—
(1) Be responsible for loss and/or damage thereafter, and for insurance.
(2) Handle all subsequent movement of the goods.
(3) Pay cost of hoisting goods into vessel where weight of goods is too great for ship's tackle.

8. The seller may desire to quote a price covering all expenses up to and including delivery of the goods upon the overseas vessel at a named port. In this case, the proper term is:
"F. O. B. vessel (named port)."

Under this quotation:

A. Seller must—
(1) Meet all charges incurred in placing goods actually on board the vessel.
(2) Be responsible for all loss and/or damage until goods have been placed on board the vessel.

B. Buyer must—
(1) Be responsible for loss and/or damage thereafter.
(2) Handle all subsequent movement of the goods.

9. The seller may be ready to go farther than the delivery of his goods upon the overseas vessel and be willing to pay transportation to a foreign point of delivery. In this case, the proper term is:
"C. & F. (named foreign port)."

Under this quotation:

A. Seller must—
(1) Make freight contract and pay transportation charges sufficient to carry goods to agreed destination.
(2) Deliver to buyer or his agent proper bills of lading to the agreed destination.
(3) Be responsible for loss and/or damage until goods have been delivered alongside the ship and clean ocean bill of lading obtained (seller is not responsible for delivery of goods at destination).

B. Buyer must—
(1) Be responsible for loss and/or damage thereafter and must take out all necessary insurance.
(2) Handle all subsequent movement of the goods.
(3) Take delivery and pay costs of discharge, lighterage and landing at foreign port of destination in accordance with bill of lading clauses.
(4) Pay foreign customs duties and wharfage charges, if any.

10. The seller may desire to quote a price covering the cost of the goods, the marine insurance on the goods, and all transportation charges to the foreign point of delivery. In this case, the proper term is:
"C. I. F. (named foreign port)."

Under this quotation:

A. Seller must—
(1) Make freight contract and pay freight charges sufficient to carry goods to agreed destination.
(2) Take out and pay for necessary marine insurance.
(3) Be responsible for loss and/or damage until goods have been delivered alongside the ship, and clean ocean bill of lading and insurance policy have been delivered to the buyer, or his agent. (Seller is not responsible for the delivery of goods at destination, nor for payment by the underwriters of insurance claims.)
(4) Provide war risk insurance, where necessary, for buyer's account.

B. Buyer must—
(1) Be responsible for loss and/or damage thereafter, and must make all claims to which he may be entitled under the insurance directly on the underwriters.

(2) Take delivery and pay costs of discharge, lighterage and landing at foreign port of destination in accordance with bill of lading clauses.

(3) Pay foreign customs duties and wharfage charges, if any.

EXPLANATIONS OF ABBREVIATIONS.

F. O. B.	Free on board.
F. A. S.	Free alongside ship.
C. & F.	Cost and Freight.
C. I. F.	Cost, insurance and freight.
L. C. L.	Less than carload lot.

RUBBER IN THE SAFETY COUNCIL.

THE NATIONAL SAFETY COUNCIL, made up of prominent men in all lines of industry, now has a rubber section. Although this is but a beginning, a score of the largest rubber companies are members and send from two to half a dozen representatives to each meeting. At the first meeting there were present:

E. H. Fitzgerald. M. Klein, The Federal Rubber Co., Cudahy, Wisconsin; Harold Martin, T. J. Dwyer, H. T. Greene, and E. Focand, The Fisk Rubber Co., Chicopee Falls, Massachusetts; P. B. Martens, T. S. Petty, C. G. Dimcombe, A. L. Weyland, E. S. Hoener, N. A. Shepard and M. F. Letzel, the Firestone Tire & Rubber Co., Akron, Ohio; R. N. Watson, and P. A. Belden, The Goodyear Tire & Rubber Co.; W. N. Fitch, W. L. Snyder, J. C. Howard, E. P. Raiford, A. C. Mack, W. G. Oberholser, E. K. Davis, G. A. Knofler, and R. B. Howe, The B. F. Goodrich Rubber Co.; H. G. Pushee, The General Tire & Rubber Co., Akron, Ohio; A. L. Rose, The Kelly-Springfield Tire Co., Akron, Ohio; S. M. Shott, Morgan & Wright, Detroit, Michigan, R. W. Fogerty, A. C. Peterjohn, United States Rubber Co., Mechanical Goods Division, Cleveland, Ohio; W. H. Larkin, Jr., J. W. Towsen, United States Rubber Co., Mechanical Goods Division, Passaic, New Jersey; R. L. Gould, United States Rubber Co.; Dr. Haron, Hood Rubber Co., Watertown, Massachusetts.

ROUND TABLE SUGGESTIONS.

In discussing safety appliances for washers, crushers and mills the following were cited: use of wooden paddles to push rubber between walls; cutting blocks of rubber wedge shape to facilitate entry between rolls; mill rolls placed shoulder high, bars in front of washers over which the sheet of rubber is fed; individual clutches on each mill which are inspected daily; automatic reversing devices.

Electric signals from motor pit to each mill in every line; motor pit switch-boards set six feet above floor to give clear view of line; reports of tests of safety devices signed by inspectors and delivered regularly to master mechanic.

Calenders equipped with electric clutch and brake; special gears for opening center and lower rolls, rolls being lowered so that opening clears the hand; triangular casting at opening with ¼-inch clearance to prevent men from getting near opening; split casting and one-inch slot on fabric calenders; inch bar across calender connected with bell crank to trip switch operating dynamic bar on calendar; floor near calender surfaced with carborundum.

Automatic conveyor system with hydraulic opening for opening molds after curing; special opening bar with increased leverage; special track for hauling molds and cores; endeavor to make men use respirators on dusty job handling compounds; milk served to men in compound room, mills hooded and strong suction used; danger of poisoning from benzol, rash on hands and free from hexamethylene tetramine (eurotropin), eliminated by applying borax in solution with 20 per cent gum arabic.

RUBBER FACTORY ACCIDENT PREVENTION ACTIVITIES TO BE STANDARDIZED.

A census of all the accidents that have occurred in the rubber industry will be undertaken by the Rubber Section of the National Safety Council with the view of standardizing accident prevention activities and accident statistics in that industry. This was decided on at a meeting of the executive committee of the Rubber Section, held at the headquarters of the National Safety Council in Chicago on January 20 and 21. Among those present were S. M. Schott, of the Morgan & Wright plant of the United States Rubber Co., Detroit, Michigan, chairman of the section; E. H. Fitzgerald, Federal Rubber Co., Cudahy, Wisconsin, vice-chairman of the section; R. M. Watson, The Goodyear Tire & Rubber Co., Akron, Ohio, secretary; W. N. Fitch, The B. F. Goodrich Co., Akron, Ohio, chairman of the bulletin committee, and H. T. Martin, The Fisk Rubber Co., Chicopee Falls, Massachusetts, chairman of the program committee.

Plans were also laid at this meeting for a nation-wide membership campaign with the view of including in the Rubber Section of the Council every progressive rubber plant in the country. The officers of the section laid the ground work for an extensive bulletin service and for a sectional program at the next annual congress of the National Safety Council. Twenty-six bulletins depicting the principal hazards in the rubber manufacturing industry and methods of elimination will be issued by this section to its members during the ensuing year along with the general bulletins of the Council.

The tentative program for the 1920 safety congress calls for three sessions of the Rubber Section, when the reports of committees will be followed by papers on "The Present and Future of Safety in the Rubber Industry," "Health Hazards in the Rubber Industry," and a general round-table discussion of these topics. The program includes papers and discussions on "Making Mills and Calenders Safe," "Handling Materials," and "Vulcanizing Apparatus." The election of officers will be followed by formal papers and discussions of "Industrial Sanitation" and "Methods of Educating Workmen in Safety."

R. M. Watson was appointed chairman of the committee which will investigate accidents and accident statistics with the view of standardization. The findings of this committee and the classifications recommended will be presented at the next safety congress. H. T. Martin was appointed chairman of the committee on standardization of safety rules and safety instruction. The companies that are now members of the Rubber Section of the National Safety Council are as follows:

Batavia Rubber Co., Batavia, New York; Boston Woven Hose & Rubber Co., Boston, Massachusetts; Braender Rubber & Tire Co., Rutherford, New Jersey; Dunlop Tire & Rubber Goods Co., Limited, Toronto, Ont., Canada; Electric Hose & Rubber Co., Wilmington, Delaware; Federal Rubber Co., Cudahy, Wisconsin; Firestone Tire & Rubber Co., Akron, Ohio; The Fisk Rubber Co., Chicopee Falls, Massachusetts; General Tire & Rubber Co., Akron, Ohio; Gillette Rubber Co., Eau Claire, Wisconsin; The B. F. Goodrich Co., Akron, Ohio; The Goodyear Tire & Rubber Co. of Canada, Limited, Toronto, Ontario, Canada; The Goodyear Tire & Rubber Co., Akron, Ohio; Gutta Percha & Rubber Limited, Toronto, Ontario, Canada; Hood Rubber Co., Watertown, Massachusetts; Kelly-Springfield Tire Co., Akron, Ohio; The McGraw Tire & Rubber Co., East Palestine, Ohio; Mechanical Rubber Co., Cleveland, Ohio; The Miller Rubber Co., Akron, Ohio; New Jersey Car Spring & Rubber Co., Inc., Jersey City, New Jersey; Norwalk Tire & Rubber Co., Norwalk, Connecticut; Oak Tire & Rubber Co., Limited, Oakville, Ontario, Canada; Pennsylvania Rubber Co., Jeanette, Pennsylvania; Philadelphia Rubber Works Co., Akron, Ohio; Plymouth Rubber Co., Canton, Massachusetts; Quaker City Rubber Co., Philadelphia, Pennsylvania; Racine Rubber Co., Racine, Wisconsin; Republic Rubber Corp., Youngstown, Ohio; Rotary Tire & Rubber Co., Zanesville, Ohio; Sprague Tire & Rubber Co., Omaha, Nebraska; Stowe & Woodward Co., Campello, Massachusetts; Thermoid Rubber Co., Trenton, New Jersey; United States Rubber Co., New York City; United States Rubber Reclaiming Co., Inc., New York City.

Machinery Equipment for Tire Repairing and Rebuilding.

THE TIRE REPAIR BUSINESS has shared in the rapid increase of the automobile and tire industries and many special machines and appliances have been developed for rapid and perfect work. The present article is limited to the principal types of repair shop equipment that are most essential for the work of repairing, retreading and rebuilding tires.

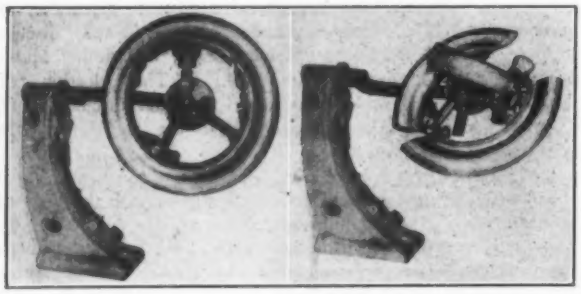
TIRE LASTS.

TIRE LASTS.

The tire last is indispensable for supporting the tire while making fabric repairs. It is made of cast iron, the shape of the inside of the casing with convenient brackets for attaching to the bench.

TIRE BUILDING STAND.

For rebuilding or retreading tires the tire building stand is standard equipment. For this work it is usually provided with a collapsible core, as shown in the illustration. The stand is fitted with an automatic locking device that holds the core securely in any desired position, so that the tire can be revolved in either direction or inclined at any angle.



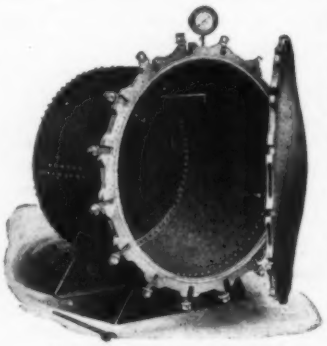
BUILDING STAND.

RETREADING KETTLE VULCANIZERS.

In repair plants where retreading is done on a moderate scale, vertical pot heaters or vulcanizers are usually employed for curing the retread, owing to the small steam consumption and relatively small installation cost.

KETTLE VULCANIZER.

They usually vary in capacity from two to four tires. Generally they are of the simple kettle type, although the annular construction is particularly economical of steam for a small installation, and will cure from two to four casings at one heat. Others have bolted-on lids or heads held in place by a number of hinged bolts fitting into slots in the edges of the kettle and lid. There is also a boltless variety in which the lid is opened and closed by revolving it about eight inches on a central trunnion, and holding it against pressure by lugs engaging with companion lugs on the supporting frame. Some lids are raised by a screw, chain block or weight, and swung to one side on a crane or overhead track; others are hinged and counterbalanced. Where the lid and the vulcanizer come together the surfaces are machined to accommodate a standard square packing ring.



HORIZONTAL VULCANIZER.

Medium size vulcanizers average 37½ inches in diameter and have a depth of 10 to 26 inches with capacity for two to seven 36-inch casings. Large ones average 43 or 43½ inches in diameter and have a depth of 16 to 31 inches with capacity for four to seven 42-inch casings. Regular equipment includes a steam gage, safety valve, two test cocks and supporting legs. In the case of vertical vulcanizers there is a bottom grating to support the tires above the water from condensed steam and permit steam circulation all around the casings.

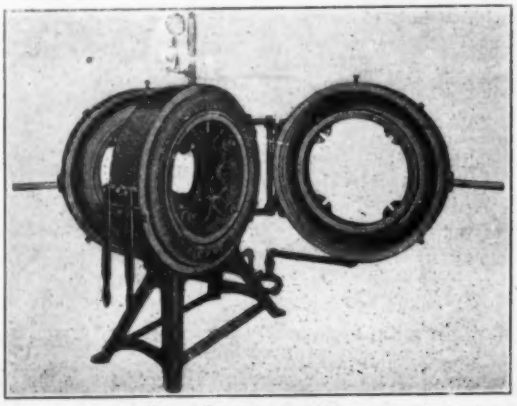
HORIZONTAL RETREADING VULCANIZERS.

In repair plants where considerable retreading is done a horizontal retreading vulcanizer, capable of taking care of all sizes of casings is usually employed. These vulcanizers have a bolted-on, hinged door requiring no overhead tackle or counterweight. They average 46½ or 47 inches inside diameter, and 40 inches in length, with a capacity for six to eight 42-inch tires.

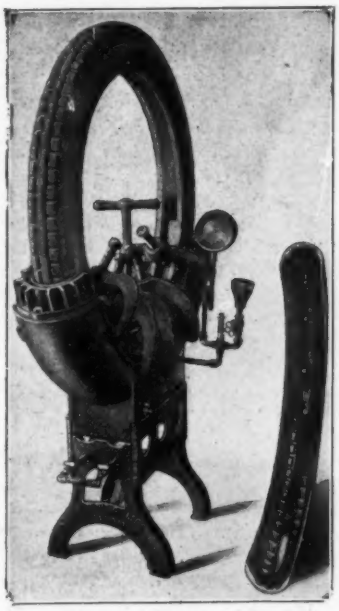
RETREADING MOLD.

RETREAD MOLD FOR RIBBED OR NON-SKID TREADS.

A retread mold for curing one casing at a time, stands at convenient height on three legs and is very economical of steam.



TWIN RETREADING MOLD.



CAVITY RETREAD MOLD.

The beads and side walls are not subjected to any steam whatever that might impair the fabric through overcuring or cause separation of the beads. No wrapping is required, and as the pressure of the mold is everywhere uniform, no edges of the plies nor low spots will be visible, nor will the tread be loose as sometimes happens after curing in a pot heater because of careless wrapping.

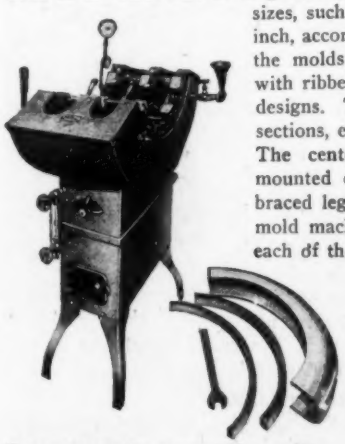
The use of a retread mold is simple. After the new tread has been applied, an air bag is placed in the casing which is mounted on an ordinary rim. The top half of the mold is raised, the casing placed within, and both halves are bolted together. The air bag is then inflated, steam is turned into the mold, with drip cocks opened and the casing remains in the mold until cured. When removed from mold and rim the tire has the appearance of a new casing.

One of the advantages of the retread mold is that the outward pressure exerts an even tension during the cure, so that each cord in the tire carries its share of the load and there are no wrinkles or buckles, causing one ply to work against another and develop a break.

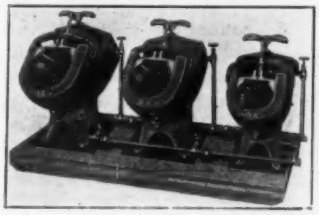
SECTIONAL CAVITY VULCANIZER.

TWIN RETREADING MOLDS.

With twin full-circle molds two casings may be cured simultaneously, both of the same size or neighboring sizes, such as 30 by 3½ and 31 by 4-inch, according to the construction of the molds. They may be provided with ribbed or special non-skid tread designs. The molds consist of three sections, each cored to receive steam. The center member is stationary, mounted on edge and supported by braced legs. It has one-half of each mold machined on either side, while each of the two outside hinged members has the corresponding half. Steam is admitted to all three sections at their lowest points and condensation in the molds is removed by the same pipes. The two outside sections have hinged, swing steam joints directly under the main hinges and can be opened and closed without escape of steam. Four bolts hold the three sections of the mold together. Circular air bags are placed inside the casings and inflated to 125 to 150 pounds' pressure during the cure.



COMBINATION SECTIONAL VULCANIZER.

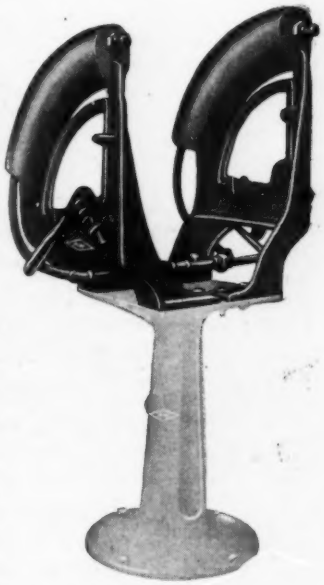


PNEUMATIC TRUCK TIRE SECTIONAL VULCANIZER.

CAVITY RETREAD MOLD.

When retreading is done on a moderate scale, the cavity retread mold is used. It is similar in operation to the ordinary sectional cavity vulcanizers for curing tread repairs, but is made to cure one-third instead of one-fourth or one-fifth of a 36-inch diameter circle.

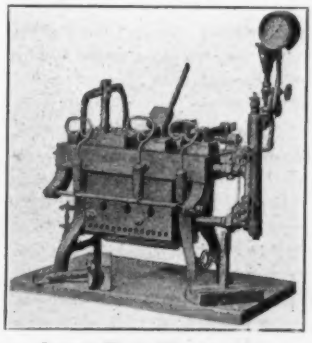
An objection to the principle on which all cavity retread molds work is the fact that parts of casings larger or smaller than 36-inch are subjected to a double cure. The circumference of a 36-inch diameter circle is 113 inches, while that of a 30-inch casing is only 94 inches; obviously when a 30-inch casing is placed three times in the mold for curing, 19 inches of the casing is subjected to a double cure. A 37-inch tire requires four cures to cover its circumference of 116¼ inches, yet four applications of the mold cover nearly 151 inches, so that about 34½ inches are subjected to double cure.



INSIDE PATCH VULCANIZER.

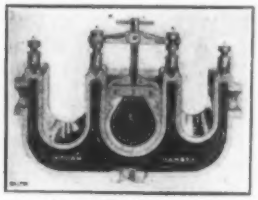
SECTIONAL CAVITY VULCANIZERS.

Sectional cavity vulcanizers for curing outside fabric and tread repairs consist of one to five molds, steam jacketed around the cavity, cast *en bloc* or singly, and made in either one-fourth or one-fifth circle to measure from 15 to 18 inches long on the tread. Three, four and five-cavity outfits are most common, and will accommodate all casings from 2¼ or 2½ to 5-inch. The molds are mounted on substantial metal stands of convenient height, and some are equipped with a self-contained boiler. Separate molds of different sizes, each standing on short metal legs for mounting on a wooden bench, are often assembled with pipe connections, according to local requirements. With a separate mold for each size casing, no reducing shells are required, direct contact is always certain between the hot walls of the vulcanizer and the casing, and there is no uncertainty as to evenness of cure.



INNER TUBE VULCANIZER.

Air-cooled flanges are a feature of one make of sectional cavity vulcanizers. One-eighth inch of heat-resisting material is placed between the flanges and vulcanizer, causing both ends of the cavity to remain cool while heat is maintained up to this heat insulating material, thus obviating unsightly and damaging lumps



AIR BAG SYSTEM.

at the ends of repaired sections of the tread.

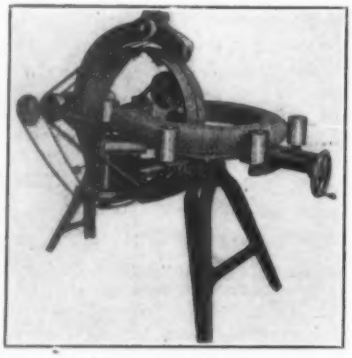
A combination adjustable sectional vulcanizer of unique design is made in capacities from one to six cavities, inclusive. It is furnished with an assortment of adjustable tread and bead molds, to be placed between the movable steam-jacketed side walls. The assembly of parts can be changed in a few minutes to meet the requirements of the work in hand.

PNEUMATIC TRUCK TIRE VULCANIZERS.

The introduction of the giant pneumatic tire has opened a new field in the tire repair business, requiring large sectional vulcanizers. They are made in sizes to fit 6, 7 and 8-inch tires, respectively, each vulcanizer equipped with one pair of straight side bead molds.

INSIDE PATCH VULCANIZERS.

Inside patch vulcanizers made in one-fourth or one-fifth circle, come in small, medium and large sizes. They are of smooth cast iron, designed for mounting on bench or stand, and have suitable steam pipe connections, valves and pet cocks to release cold air from the form. A triangular frame within the supports, together with one or two thumb or crank screws or nuts, provide the necessary bandage tightener.



POWER RAG WRAPPING MACHINE.

INNER TUBE REPAIR VULCANIZER.

Inner tube repairs are vulcanized under pressure, in contact with a steam-heated plate.

Adjustable and constant pressure is applied to the tubes while being cured by means of heavy oil-tempered springs, which draw down the swinging levers. A steel nut is placed inside the spring and the handle can be screwed in or out of the nut so that a pressure of six ounces or fifty pounds can be brought to bear on the repair. The adjustment can be changed in an instant.

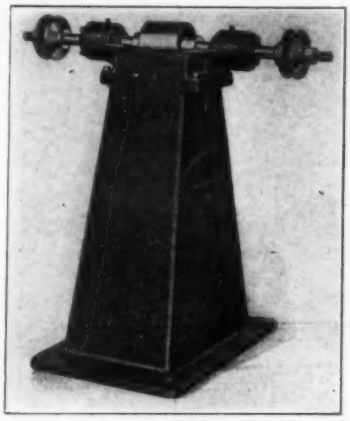
Where solid screw clamps are used it is difficult to properly judge the pressure on the repair. Moreover, as the gum flows during the cure, the thickness of the repair is reduced, partly relieving the pressure on the tube patch. This does not occur with the spring tension system.

HAND RAG WRAPPING MACHINE.

AIR BAG SYSTEM.

In the air bag system of tire repairing, sand bags and wire spirals are displaced by inflatable sectional bags. These air bags are made of fabric and rubber, and at one end have a tube and air valve through which air is forced into the bag. They come in different sizes—one for each size of casing. A machine equipped with air bag molds enables the operator to save time, economize on materials, and turn out a repair that can be guaranteed to outlast the rest of the tire.

The cross-sectional view of a three-cavity vulcanizer, herewith, shows how the steam is conducted to all parts of the three cavities of the air bag molds. Each cavity is so constructed that the steam enters at the lowest point, and rises to the highest, avoiding steam pockets. This construction renders all the molds self-draining. By means of reducing shells, various sizes of tires can be accommodated in the same mold cavity.



BUFFING STAND.

POWER RAG WRAPPING MACHINES.

In large plants power wrapping machines are used in preparing retreaded casings for curing. They wrap much more tightly, more quickly and at less expense than can be done by hand.

In one type the tire lies flat on a table, and revolves on three rollers driven by two upright feed rollers. There are two other vertical rollers adjustable to the diameter of the casing. A rotary drum, belt-driven, that carries the spool containing the tape, rolls on fiber wheels. One or two spools of tape are required to wrap a tire. The hinged gate of the revolving spool drum is set to the opening in the frame to admit or remove the tire.

A machine of similar construction is built to be fastened to a wall or post. It is quickly adjustable to casings of all sizes by a hand-wheel that separates or draws together two feed rollers.

In connection with these machines a power spool winder is used to roll the wrapping tape ready for use.

HAND RAG WRAPPING MACHINES.

The operation of hand rag wrapping is as follows: The wet bandage is tightly wound on its spool and dropped into a recessed slot in the frame and the pressure arm released against the bandage. A portion of the bandage is unwound and passed through the guides and once around the tire, establishing an over-lap in the bandage and securing the end thereby. The yielding roller arm is clasped about the tire, which is placed on a pair of trestle bars or between two benches, and the machine is rotated around the tire, which causes the bandage to be resistingly drawn from the spool and forcibly applied to the tire. The average tire takes two twenty-five-yard bandages, of course, depending upon the amount of overlap or feed, which is regulated at the option of the operator.

TREAD ROLLING MACHINE.

BUFFING STANDS.

Buffing stands are made either with column base and counter-shaft and pulleys for the ceiling, or without countershaft and base for mounting on a bench. Several types have the spindle extended on one end so that a casing can be buffed with a wire brush without interference from the belt or column of the stand, while the short end gives a rigid support for a rotary rasp. An emery wheel may be substituted when desired for grinding tools.

TREAD ROLLERS.

Tread rollers save much time and labor, rolling down the rubber and fabric much more effectively than it is possible to do by hand, and insuring a secure repair. The device consists of a frame designed to be mounted on a bench, a concave and a convex roller, operating crank and hand wheel screw to adjust the space between the rollers.

Government Standard Specifications for Rubber Tires, Tire Repairs and Accessories.

General Specifications.

GENERAL.

THESE SPECIFICATIONS cover bicycle, motorcycle and automobile ribbed or non-skid pneumatic casings, solid tires, pneumatic inner tubes and accessories used by the War Department. The following are details and tests as are common to the products. For specific information applying directly to particular articles, see detailed specifications which shall take precedence whenever there is any conflict.

All casings shall be of the manufacturer's standard non-skid, clincher type, designed for the S. A. E. clincher rim of the sizes as specified in the detailed specifications.

CONSTRUCTION.

To be manufactured from the best designated material; free from all imperfections and of dimensions as given in the detailed specifications or proposal submitted to manufacturer.

(*a*) ALL FABRIC must be thoroughly dried in accordance with standard manufacturing practice before it is rubberized. Any change in the weight or construction must meet with the approval of the War Department and authority be given the manufacturer in writing.

(*b*) FLAPS: Each casing shall have a flap in accordance with standard manufacturing practice unless otherwise specified.

(*c*) LINING: The inside of each casing shall be properly lined in accordance with standard manufacturing practice.

MARKING, WRAPPING AND PACKING.

(Does not apply to solid tires.)

(*a*) MARKING: Casings shall be plainly marked with raised rubber letters, "U. S. A.," manufacturer's name, serial number, date, size, and the equivalent metric system as recommended by the Society of Automotive Engineers.

(*b*) WRAPPING: All casings shall be spirally wrapped according to standard practice and properly labeled on the outside and marked "U. S. A.," size, type, name of manufacture, and the month and year of manufacture stamped thereon in a conspicuous place.

(*c*) PACKING: Packing shall conform to requirements as outlined in the original proposal.

MATERIAL.

(*a*) FABRIC: The cotton fabric or cord layers shall be well, evenly, and firmly woven from good cotton, as free from unsightly defects, dirt, knots, lumps, and irregularities of twist as is consistent with the best manufacturing practice and conform to detailed specifications.

(*b*) RUBBER COMPOUNDS: They shall conform to the detailed specification and be free from ingredients known to the rubber trade as "oil substitutes," and contain no reclaimed rubber unless specifically permitted.

When new rubber is specified, it shall be the best quality new wild or plantation rubber.

TESTS.

All tests on material as a whole and on individual parts shall be performed according to methods adopted by the National Bureau of Standards as outlined in their Circular No. 38, "Testing of Rubber Goods," in effect at date of opening of proposal.

Hydrostatic and tensile tests shall be in pounds per square inch. Hydrostatic tests are to be made at the discretion of the inspector.

(*a*) FABRIC: The usual methods of inspection used by tire companies in commercial practice to discover defects in each roll of fabric shall be employed.

The tensile strength shall be obtained by cutting strips from fabric 6 inches long, 1¼ inches wide and unraveled from each side to a width of one inch. Jaws of testing machine shall not be more than 1 inch wide and 3 inches apart, separating at the rate of 12 inches per minute. Results obtained by taking the average of three tests each on both warp and filling shall be accepted as the tensile strength of the fabric. The tests shall be made when practicable after conditioning the fabric in an atmosphere having a relative humidity of 65 per cent and at a temperature of 70 degrees F. for two hours. When not practicable to test as above, the fabric may be tested under existing humidity conditions and results corrected to a 6 per cent moisture basis by multiplying by the following factor:

$$\frac{100}{100 \text{ plus } 7 \text{ (per cent moisture} - 6)}$$

NOTE.—The factor will be less than unity when the per cent moisture is greater than 6, and vice versa.

Moisture shall be determined by weighing six samples together before testing, and tensile strength immediately obtained in rapid succession. The broken samples (entire) after rupture shall be placed in a ventilated drying oven at 105 degrees to 110 degrees C. (221 degrees to 230 degrees F.) until weight is constant. Moisture present shall be calculated on the basis of the bone dry sample.

All fabric weights are given in ounces per square yard, and shall be calculated on 6 per cent moisture basis. Tolerance 3 per cent, plus or minus.

(*b*) CORD FABRIC: Tensile strength of cords shall be made on 10 individual cords taken from each cord and the results must be up to the standard specification of the individual manufacturer.

(*c*) FRICTION OR ADHESION: The friction between plies of fabric or rubber compound shall be determined on a sample 1 inch in width, measured circumferentially, and be cut from the casing and tested by using a standard friction or dead weight machine.

On a section of the casing the plies are started and pulled down 2 inches at one bead; which bead is clamped in the jaws of the friction testing apparatus. Test shall be made on any or all plies of the fabric. The adhesion between breaker and tread, breaker and cushion, cushion and carcass, side wall and carcass shall be determined. The rate of separation shall be not more than 1 inch per minute when the weight outlined in the detailed specification is used.

(*d*) RUBBER COMPOUND: Test pieces shall be cut longitudinally and shall be ¼-inch wide over a gage length of 2 inches, the ends being gradually enlarged to width approximately 1 inch. Results shall be based upon the average of four tests made at a temperature between 65 degrees and 90 degrees F., unless otherwise specified.

The tensile strength shall be determined with a machine, the jaw separating at the rate of 20 inches per minute. The permanent set shall be determined by sample stretched 2 inches to 10 inches for 10 minutes followed by a rest of 10 minutes, unless otherwise specified.

(*e*) ROAD TEST: Casings will not be given consideration unless the maker submitting the bid furnishes an affidavit stating that he has maintained and will continue to maintain machines used exclusively for test work, as called for in detailed specifications.

The speeds, loads, tire sizes, inflations and road conditions must be such that the casings are properly tested. The Government may appoint an inspector to see that the above conditions are complied with.

A bidder must supply an affidavit before delivering casings to the Government, stating that the casings to be delivered are the same cross-section and practically duplicate, in construction and material as casings which he has previously tested in accordance with the above, and a sufficient number of casings satisfactory to the Government, shall have averaged on the rear wheels the number of miles as called for in detailed specifications.

INSPECTION.

The Government reserves the right to make any inspection test or analysis necessary to insure the product meeting all requirements of specification which shall be conducted in accordance with methods outlined and approved by the War Department, and which shall be furnished to successful bidders.

PNEUMATIC AUTO CASING (FABRIC CONSTRUCTION).

NO. GS 1010	30 by 3½ inches.
NO. GS 1011	31 by 4 inches.

GENERAL.

(*a*) This specification covers requirements for pneumatic auto casings of fabric construction, size 30 by 3½ inches, which shall be designed to carry a load of 570 pounds when inflated to 55 pounds per square inch and size 31 by 4 inches a load of 815 pounds when inflated to 65 pounds per square inch; both designed for the S. A. E. clincher rim size 30 by 3½ inches.

(*b*) See General Specifications for tires which are a part hereof.

CONSTRUCTION.

See General Specifications.

(*a*) Splices on the first ply of fabric shall be gum stripped.

(*b*) Carcass of casing for 30 by 3½-inch shall consist of not less than four nor more than five separate plies of tire fabric and 31 by 4-inch not less than five nor more than six separate plies, with friction coat on two sides and skim coat on one side. The gage of one ply frictioned on two sides and skim coated on one shall be at least 0.045-inch. Each ply shall have not more than two splices, which must be at least 7 inches apart, and the splices in the casing shall be at least 3 inches apart; all measurements on the circumference of the casing.

(*c*) Beads shall be constructed with a core filler as in standard commercial practice.

(*d*) One chafing strip of square-woven fabric weighing not less than 8 ounces per square yard shall be used on each side of the casing; and shall extend upward on the side of the casing at least ⅜-inch from the channel of the bead.

(*e*) There shall be a cushion of rubber compound applied over the fabric which shall be wider than the breaker. The minimum gage shall be 0.045-inch for 30 by 3½-inch and 0.050-inch for 31 by 4-inch.

(*f*) Over the cushion there shall be at least one breaker strip of open weave fabric made from long-staple cotton weighing not less than 8 ounces per square yard, as in standard commercial practice, coated on both sides with a rubber compound which shall insure a perfect union between the cushion and tread after the cure. Breaker strip for 30 by 3½-inch, minimum width 2¼ inches, for 31 by 4-inch, minimum width 2½ inches.

(*g*) Rubber dimensions:

Sizes	30 x 3½	31 x 4
Thickness	Inches, Minimum.	
Tread of casing in center	7/32	9/32
Tread, exclusive of non-skid portion on center	1/8	1/8
Side wall	0.05	0.05

(*h*) No flaps shall be supplied.

MARKING, WRAPPING AND PACKING.

See General Specifications.

MATERIAL.

See General Specifications.

(*a*) FABRIC must be square woven (23 by 23) from Egyptian long-staple cotton or its physical equivalent, as approved by the Government, weighing 17¼ ounces per square yard.

(*b*) Rubber compound:

	New Rubber, Per Cent Volume. Minimum.	Reclaimed Rubber, Per Cent Weight. Maximum.
Tread	65	15
Side wall	65	15
Friction and cushion	75	..

TESTS.

(*a*) Cross-sectional diameter of each tire inflated according to the recommended weight and load schedule of the S. A. E. shall be for 30 by 3½-inch less than 3-7/16 inches; and for 31 by 4-inch, 4 inches.

(*b*) Shall withstand water pressure of 300 pounds per square inch without injury.

(*c*) FABRIC: Tensile strength, warp or filling, 165 pounds minimum.

(*d*) FRICTION:

		Pounds.
Strength of union between plies of fabric	minimum	16
Strength of union between breaker and tread	minimum	28
Strength of union between breaker and cushion	minimum	28
Strength of union between cushion and carcass	minimum	16
Strength of union between side wall and carcass	minimum	10

(*e*) RUBBER COMPOUND:

		Tread. Minimum.	Side Wall. Minimum.
Tensile strength		2,200	1,500
Ultimate elongation	inches	2-11	2-11
Set:			
Stretch	inches	2-10	2-10
Set	per cent	25	25

(*f*) ROAD TEST: Manufacturer shall maintain at least two cars used exclusively for test work. They shall average at least 1,000 miles per car per week; and a sufficient number of casings (not less than six) shall have averaged on the rear wheels at least 4,000 miles.

INSPECTION.

See General Specifications.

PNEUMATIC AUTO CASINGS (CORD CONSTRUCTION).

NO. GS 1020	33 by 4 inches
NO. GS 1021	35 by 5 inches
NO. GS 1022	36 by 6 inches
NO. GS 1023	38 by 7 inches
NO. GS 1024	40 by 8 inches

GENERAL.

(*a*) This specification covers requirements for pneumatic automobile casings of cord construction which conform to the following:

Size.	Designed to Carry Load— Pounds.	Inflation Per Square Inch. Pounds.
33 by 4 inches	815	65
35 by 5 inches	1,500	75
36 by 6 inches	2,000	90
38 by 7 inches	2,700	100
40 by 8 inches	3,650	110

Designed for S. A. E. straight side rim as follows:

Casing Size.	Rim Size.
33 by 4 inches	32 by 3½ inches and 33 by 4 inches.
35 by 5 inches	34 by 4½ inches.
36 by 6 inches	36 by 6 inches.
38 by 7 inches	38 by 7 inches.
40 by 8 inches	40 by 8 inches.

(*b*) See General Specifications for tires, which are a part hereof.

CONSTRUCTION.

See General Specifications.

(*a*) Casings shall consist of number of separate plies of cord, applied in such manner that an equal number of plies shall run in each diagonal direction across the casing as follows:

	Number of Plies.	
Size.	Minimum.	Maximum.
33 by 4 inches	4	8
35 by 5 inches	4	10
36 by 6 inches	4	12
38 by 7 inches	4	14
40 by 8 inches	4	16

(*b*) Two chafing strips weighing not less than 8 ounces per square yard shall be used in each side of casing. Each chafing strip shall extend upward on side of casing from the heel of the bead as follows:

Size.	Extension Upward. Inches.
33 by 4 inches	1
35 by 5 inches	1⅛
36 by 6 inches	1½
38 by 7 inches	1¾
40 by 8 inches	2

(*c*) One chafing strip shall extend at least 3/16-inch above the other for sizes 33 by 4 inches and 35 by 5 inches; and ¼-inch for 36 by 6 inches, 38 by 7 inches, and 40 by 8 inches.

(*d*) There shall be a cushion of rubber compound applied over the cords which shall be wider than the breaker and gage as in Table I.

(*e*) Over the cushion there shall be at least one breaker strip of open-weave fabric made from long-staple Egyptian cotton or its physical equivalent as approved by the Government; weight as in Table I, such as in standard commercial practice, coated on both sides with a rubber compound to insure a perfect union between the cushion and tread after cure.

TABLE I.

Size.	Gage of Cushion.	Width of Breaker Strip. Inches.	Weight of Breaker Fabric Per Square Yard. Ounces.	Thickness of Tread of Casing in Center. Inch.	Thickness of Tread Exclusive of Non-skid Design. Inch.	Thickness of Side Wall. Inch.
33 by 4 inches	0.05	2⅝	10	3/16	3/16	0.0625
35 by 5 inches	.0625	3½	10	7/32	7/32	.0625
36 by 6 inches	.08	4¼	10	1/4	1/4	.0625
38 by 7 inches	.08	5½	18	5/16	5/16	.0625
40 by 8 inches	.09	6½	18	11/32	3/4	.0625

MARKING, WRAPPING AND PACKING.

See General Specifications.

MATERIAL.

See General Specifications.

(*a*) CORD MATERIAL shall be of the best quality combed Sea Island or Sakellarides cotton or their physical equivalent as approved.

(*b*) RUBBER COMPOUND:

	New Rubber Per Cent Volume.
Tread ..... minimum	70
Side wall ..... minimum	65
Friction and cushion ..... minimum	85

TESTS.

See General Specifications.

(*a*) MEASUREMENTS: Cross-sectional diameter of each tire inflated to recommended weight and load schedule of the S. A. E. shall be:

Size in inches	33 by 4	35 by 5	36 by 6	38 by 7	40 by 8
Diameter	4.2	5.4	6.3	7.35	8.4

(*b*) Tires shall be capable of withstanding water pressure of 350 pounds per square inch without injury.

(*c*) MINIMUM STRENGTH of the casing (strength factor) is the product of the number of cords per inch measured at the tread at right angles to the cords, multiplied by the strength of the individual cords as taken from the cord casing, multiplied by the number of plies:

Size in inches	33 by 4	35 by 5	36 by 6	38 by 7	40 by 8
Strength factor in pounds.	2,000	2,500	3,000	3,500	4,000

(*d*) FRICTION:

	Pounds.
Strength of union between breaker and tread ..... minimum	32
Strength of union between breaker and cushion ..... minimum	32
Strength of union between side wall and plies ..... minimum	14
Strength of union between cushion and plies ..... minimum	16

(*e*) RUBBER COMPOUND:

	Tread. Minimum.	Side Wall. Minimum.
Tensile strength	2,400	1,500
Ultimate elongation ..... inches	2-12	2-11
Set:		
Stretch ..... inches	2-10	2-10
Set ..... per cent	25	25

(*f*) ROAD TEST: Manufacturers shall maintain at least two cars used exclusively for test and they average at least 1,000 car miles per car week for sizes 33 by 4 inches and 35 by 5 inches; and 500 car-miles per car per week for 36 by 6 inches, 38 by 7 inches, and 40 by 8 inches. A sufficient number of casings (not less than six) for sizes 33 by 4 inches and 35 by 5 inches and not less than four for sizes 36 by 6 inches, 38 by 7 inches, and 40 by 8 inches shall have averaged on the rear wheels at least 5,000 miles.

INSPECTION.

See General Specifications.

PNEUMATIC INNER TUBES (GRAY).

GENERAL.

(*a*) This specification covers requirements for pneumatic inner tubes of the endless type, except motor cycle tubes, which shall be butt end or endless, as ordered, of the following sizes:

GS 1040	28 by 1½ inches
GS 1041	28 by 1⅝ inches
GS 1042	28 by 3 inches
GS 1043	29 by 3½ inches
GS 1044	30 by 3½ inches
GS 1045	31 by 4 inches
GS 1046	33 by 4 inches
GS 1047	35 by 5 inches
GS 1048	36 by 6 inches
GS 1049	38 by 7 inches
GS 1050	40 by 8 inches

(*b*) See General Specifications for Tires which are a part hereof.

CONSTRUCTION.

(*a*) GAGES: Tubes shall conform to the following table:

Size.	Medium Pole Size. Inches.	Minimum Thickness. Inch.	Minimum Finished Length. Inches.
28 by 1½	1	0.048	77
28 by 1⅝	1	.048	77
28 by 3	1⅞	.072	77
29 by 3½	2⅛	.090	78
30 by 3½	2⅛	.090	81
31 by 4	2¼	.095	82
33 by 4	2¼	.110	89
35 by 5	3	.135	92
36 by 6	3½	.180	92
38 by 7	4¼	.210	94
40 by 8	5	.250	96

(*b*) If tube is mold cured, measurements must be equivalent to above as determined by volume, and if larger size poles are used, volume of rubber shall be at least equal to above measurements.

(*c*) The splice shall be as strong as the rest of the tube under the inflation test.

(*d*) Each tube shall be properly fitted with one complete Schrader valve or its approved equal, and not leak or tear out under ordinary usage, as follows:

Size.	Schrader's No. or Approved Equal.
28 by 1½	1022
28 by 1⅝	1022
28 by 3	1936
29 by 3½	1936
30 by 3½	725
31 by 4	725
33 by 4	725
35 by 5	792
36 by 6	2033
38 by 7	2033
40 by 8	2033

Each valve shall be fitted with lock nut, rim nut, valve cap, and dust cap, with exception for sizes 28 by 3, 29 by 3½, 36 by 6 and over. Spreaders shall be furnished for all sizes up to and including 25 by 5.

MARKING, WRAPPING AND PACKING.

See General Specifications.

Wrapping and packing shall conform to requirements accompanying requests for bids.

MATERIAL.

See General Specifications.

Shall be made from a compound containing 93 per cent by volume (minimum) new rubber; sulphur content shall not exceed 7 per cent and organic acetone extract of the cured compound must not exceed 5½ per cent of the weight of new rubber used.

TESTS.

(*a*) Rubber compound: Test pieces shall be ¼-inch wide over a gage length of 1 inch, the ends being gradually enlarged to a width of approximately 1 inch, to provide a satisfactory gripping surface.

Ultimate elongation ..... inches	1-8½
Set:	
Stretch ..... inches	1-6
Stretch ..... per cent	10

(*b*) Each tube shall be tested for leaks by inflating with air and immersing in water.

INSPECTION.

See General Specifications.

Each lot of 1,000 tubes or less shall be tested.

(To be continued.)

TIRE AND AUTOMOBILE "SATURATION POINT" NOT IN SIGHT.

With motor vehicle registrations in the United States well past the seven million mark, certain "croakers" are writing much about the "saturation point" and that other indefinite period when the automotive industries must face "diminishing returns."

W. O. Rutherford, vice-president of The B. F. Goodrich Co., Akron, Ohio, scoffs at such pessimism, however. Automobiles, he points out, come in the "consumption" class of commodities; that is, they are used, worn out and replaced just as clothing is. He forecasts that we shall be able to absorb not only the present automobile production, but shall even sustain the greater growth which ambitious manufacturers are meditating. Continuing, he says:

So far as passenger vehicles are concerned we are now at the the crest of a buying market. Production does not equal demand, and personally, I expect this condition to exist for some time to come. I recall being told at one of the New York shows way back in 1907 that the then annual production of 60,000 cars marked the peak point in automobile manufacture and that the number of cars to be made annually would lessen rather than increase. Just as that prophet of gloom was suffering from brainstorm, so will I also classify those who today are refusing to advance with the times. The proposed car production for 1920 is 3,000,000 cars. An analysis of the market, at home and abroad, shows an ability to absorb even greater production, hence the possibility of a shortage of cars is imminent.

Foreign Import Duties on Boots and Shoes.

THE FOLLOWING TABLE, corrected to February 15, 1920, by the Bureau of Foreign and Domestic Commerce, shows the foreign import duties on rubber boots and shoes of all descriptions, imported into the various countries from the United States.

Owing to the frequency of tariff changes the figures and information given in this table should be periodically verified. It is also advised that small trial shipments be made in order to test the rates prior to sending more extensive shipments.

In the first column is given the country, while the next column contains the articles with notes regarding surtaxes, basis of rates, etc. The third column specifies whether the weight is to be taken as gross or net and the last gives the ad valorem duty or the rate of specific duty in United States currency.

COUNTRIES.	ARTICLES AND REMARKS.	Weight.	Duty (U. S. Currency).
EUROPE:			
Austria-Hungary	Shoemakers' wares, with textile goods, per 100 pounds	Net	$11.05
Belgium	Manufactures of india rubber, ad valorem	...	10%
Bulgaria	Ordinary rubber boots and shoes (galoshes), per 100 pounds (includes 20 per cent surtax)	Net	$10.51
	Other rubber boots and shoes, per 100 pounds (includes 20 per cent surtax)	Net	21.01
Denmark	Rubber boots and shoes, with textiles, per 100 pounds—including inner packing	Legal	6.03
Finland	Rubber footwear, per 100 pounds	Legal	11.53
France	Rubber footwear lined with felt, wool or any partly woolen cloth, per 100 pounds	Net	27.57
	Rubber footwear lined with cotton, hemp, or flax cloth, per 100 pounds	Net	22.07
	Footwear with soles of rubber, per pair	...	0.29
Germany	Footwear, with or without rubber soles—Unvarnished, per 100 pounds	Net	7.56
	Varnished, per 100 pounds	Net	8.64
Great Britain	Manufactures of rubber	...	Free
Greece	Galoshes of rubber, per 100 pounds	Net	$30.78
Italy	Rubber footwear, lined or trimmed with fabrics, per 100 pairs	...	38.60
	Other rubber footwear, per 100 pounds	Net	4.38
Netherlands	Rubber footwear, ad valorem	...	5%
Norway	Rubber footwear, per 100 pounds	Net	$12.16
Portugal	Rubber footwear, per 100 pounds	Net	38.44
Rumania	Rubber footwear, per 100 pounds	Legal	10.51+2%
Servia	Rubber footwear, per 100 pounds	Net	12.26
Spain	Rubber footwear, per 100 pounds	Net	26.26
Sweden	Rubber footwear, per 100 pounds	Net	14.59
Switzerland	Rubber footwear, per 100 pounds	Gross	2.63
Turkey	Rubber galoshes, boots and shoes	Net	10.50
NORTH AMERICA:			
Canada	Rubber boots and shoes, ad valorem	...	25%
	Imports of articles invoiced at prices less than the market value in the country from which exported, are liable to a "dumping" duty if such articles are also made in Canada.		
Newfoundland	Footwear and all manufactures in part or in whole of india rubber or gutta percha, ad valorem, including 10 per cent surtax	...	44%
CENTRAL AMERICA:			
Costa Rica	Rubber footwear, per 100 pounds	Gross	$21.09
Guatemala	Boots and shoes, and overshoes of rubber or rubberized cloth, per 100 pounds	Legal	46.49
Honduras	Rubber boots, per 100 pounds	Gross	65.44
	Footwear of rubberized cloth, per 100 pounds	Gross	21.81
Mexico	Footwear of rubber or cloth and rubber, including variable surtax taken as equivalent to 3 per cent of the duty, per 100 pounds	Legal	23.29
Nicaragua	Footwear of rubber such as waterproof boots and shoes, per 100 pounds	Net	22.73
Panama	Rubber footwear, ad valorem	...	15%
Salvador	Rubber footwear, per 100 pounds	Gross	$46.14
WEST INDIES:			
Cuba	Rubber footwear with cotton fabrics, per 100 pounds	Legal	11.82
Dominican Republic	Rubber footwear	Net	11.35
St. Vincent	Manufactures of rubber, ad valorem	...	17.2%
Virgin Islands	Imports from the United States	...	Free
SOUTH AMERICA:			
Argentina	Rubber footwear—includes surtax of 7 per cent—duty based on valuation of $54.72 per 100 pounds	...	47%
	Footwear of cloth and rubber, whole sole measures 25 centimeters (9.84 inches) or less, duty based on valuation of $2.90 per dozen, includes surtax of 7 per cent of valuation	...	47%
	Same footwear, larger sizes, duty based on valuation of $6.76 per dozen, includes surtax of 7 per cent	...	47%
Bolivia	Rubber footwear for men, surtax of 15 per cent is included, based on valuation of $14.00 per dozen pairs	...	51.75%
	Rubber footwear for women and children: Overshoes, rubbers, boots, lined or not, including surtax of 15 per cent, based on valuation of $0.56 per pound, legal	...	46%
	Footwear for women and children with exterior lining, with or without interior lining, including surtax of 15 per cent based on valuation of $0.88 per pound, legal	...	46%
Brazil	Rubber footwear—nominally 3 milreis per kilo.—per 100 pounds	Legal	$58.66
	(Footwear made of Pará rubber, 5 per cent of the rate shown.)		
Chile	Rubber footwear of all kinds, per 100 pounds	Net	33.11
Colombia	Rubber footwear, including surtax of 7 per cent of duty, per 100 pounds	Gross	48.53
Ecuador	Rubber footwear, per 100 pounds	Net	30.02
Paraguay	Rubber footwear, with sole measuring 25 centimeters or less, includes surtax of 1½ per cent of valuation, based on valuation of $8.69 per dozen pairs	...	63.5%
	Rubber footwear of larger sizes based on valuation of $17.37 per dozen pairs	...	63.5%
Peru	Rubber footwear, including weight of inner packing; at ports of Callao, Salavery, Paita and Pisco, surtax of 10 per cent, per 100 pounds	Legal	$32.76
	At other ports—surtax of 8 per cent per 100 pounds	Legal	32.18
Uruguay	Rubber footwear, based on valuation of $5.17 per dozen pairs—surtax of 14 per cent of valuation included	...	62%
Venezuela	Rubber footwear, including surtax of 56.55 per cent per 100 pounds	Gross	$34.26
ASIA:			
Ceylon	Rubber footwear, ad valorem	...	7.5%
China and Manchuria	Rubber boots } ad valorem	... }	5%
	Rubber shoes }	... }	
Japan	Rubber boots, per 100 pounds	Net	18.82
	Rubber shoes, per 100 pounds	Net	21.79
	Rubber overshoes, per 100 pounds	Net	19.43
OCEANIA:			
Australia	Galoshes, rubber sand boots and shoes, and plimsolls, ad valorem	...	30%
	Rubber gum and wading boots, ad valorem	...	10%
New Zealand	Rubber footwear, ad valorem	...	34¼%
AFRICA:			
South Africa	Rubber footwear, ad valorem	...	20%
With a minimum per pair of—			
	Men's	...	$0.18
	Women's	...	0.12
	Children's	...	0.06

Legal weight is not uniformly construed, but generally includes the weight of the immediate packing or container, though in some countries fixed tare allowances are made. In Argentina, Bolivia, Paraguay, and Uruguay, the duties are to be computed upon the official valuations at the rates given in the last column.

Foreign Import Duties on Rubber Tires.

THE FOLLOWING TABLE, corrected to February 15, 1920, by the Bureau of Foreign and Domestic Commerce shows the foreign import duties on rubber tires of all descriptions imported into the various countries from the United States.

The column marked "Weight" shows whether duties are levied on net or gross weight, or include simply the inner packings. The next two columns give the rate of the duty for each one hundred pounds in United States currency or the rate per cent ad valorem.

In the following monograph the surtaxes have been included and the converted rates therefore indicate the actual duty payable.

Certain charges, such as warehousing, customs handling, local taxes, revenue stamps, etc., are not included. The rates of duty shown, including the surtaxes as noted, should therefore be regarded as the minima. As changes in duties are likely to occur at any time, frequent vertification of these figures is advised.

COUNTRIES.	Weight.	Rate per 100 Pounds, U. S. Currency.	Rate Per Cent—Ad Valorem.
NORTH AMERICA:			
Canada	.....	.....	42.5
(Ad valorem duties are based on the fair market value of the articles when sold for home consumption in the country whence exported direct to Canada.)			
Central American States—			
British Honduras	.....	.....	25
(Duties based on price in the port of export.)			
Costa Rica	Gross	$4.22	.....
(In addition, there is a wharfage tax of 10.5 cents per 100 pounds.)			
Guatemala	Gross	7.21	.....
Honduras	Gross	4.36	.....
Nicaragua—Auto tires, inner tubes, solid tires, motorcycle tires, etc...	Net	27.27	.....
Panama	.....	.....	15
Salvador	Gross	13.81	.....
(A surtax of 1½ per cent of the duty is included.)			
Hawaii	.....	.....	Free
(Imports from foreign countries are subject to the provisions of the United States tariff.)			
Mexico—Auto and motorcycle tires.....{Solid.....	Gross	11.28	.....
{Pneumatic	Gross	22.58	.....
Bicycle tires.....	Legal	22.58	.....
(Not including variable paper surtax.)			
Newfoundland	.....	.....	49.5
(A surtax of 10 per cent of the duty is included.)			
West Indies—			
British—			
*Antigua	.....	.....	13.33
†Bahamas	.....	.....	25
*Barbados	.....	.....	11.25
Bermuda	.....	.....	11
*Dominica	.....	.....	12.5
*Grenada	.....	.....	10
Jamaica	.....	.....	16.66
(Tires for motor vehicles are subject to a surtax of 20 per cent of the duty, which is to be added.)			
*Montserrat	.....	.....	13.33
*St. Christopher-Nevis	.....	.....	11
*St. Lucia	.....	.....	16.5
*St. Vincent	.....	.....	12.5
*Trinidad and Tobago	.....	.....	10
Turks and Caicos Islands	.....	.....	10
Virgin Islands	.....	.....	10
Cuba	.....	.....	25
Dominican Republic—Tires for autos, bicycles, etc.	Net	5.69	.....
Tires for trucks	.....	Free	.....
Dutch Colonies	.....	.....	3
French—			
Guadeloupe	.....	.....	6
Martinique (rates not specified)...	.....	.....	.....
(Imports of other than French origin pay also the regular French import duties.)			
Haiti	.....	.....	22.24
Porto Rico	.....	.....	Free
(Imports from foreign countries are subject to the provisions of the United States tariff.)			
Virgin Islands of the United States..	.....	.....	Free
(Imports from foreign countries are temporarily subject to the duties formerly in force in the Danish West Indies.)			
SOUTH AMERICA:			
Argentina—Auto and solid tires.....	Legal	28.02	.....
Bolivia	Gross	20.29	.....
Brazil—Auto tires of Para rubber.....	.....	.....	12.51
Other auto tires.....	.....	.....	28.89
Motor truck tires.....	.....	.....	12.51
Chile	Gross	9.93	.....
Colombia	Gross	0.97	.....
Ecuador	Legal	9.93	.....
Guiana—British	.....	.....	16.5
(When imported from the United Kingdom, Canada or Newfoundland, admitted at a reduction of one-fifth of the duty.)			
Dutch	.....	.....	10
French	.....	.....	5
(The regular French import duties are also collected on goods not of French origin.)			
Paraguay—Auto tires	Legal	60.93	.....
Bicycle and motorcycle tires	Legal	96.16	.....
Peru—Auto tires	Gross	24.28	.....
Other tires	Legal	36.42	.....
Uruguay	.....	.....	45
Venezuela	Gross	10.28	.....
EUROPE:			
Austria-Hungary	Net	13.81‡	.....
Belgium—Solid tires	Net	5.69	.....
Auto tires	Net	10.16	.....
(Casings only.)			
Inner tubes	Net	14.88	.....
Bulgaria—Tires and tubes	Net	5.25	.....
Denmark—Auto tires	Net	6.08	.....
Solid tires	.....	.....	Free
Faroe Islands	.....	.....	Free
Finland—Auto tires / Inner tubes	Legal	17.55	.....
France—Auto tires and tubes	Net	17.08	.....
Solid tires	Net	11.38	.....
Cycle tires	Net	37.54	.....
Germany—Auto tires	Net	6.48‡	.....
Inner tubes	Net	6.48‡	.....
Gibraltar	.....	.....	Free
Greece	Net	1.03	.....
Iceland	Net	0.24	.....
Italy—Auto tires and tubes	Net	5.25	.....
Malta	.....	.....	5
Netherlands	.....	.....	5
Norway—Auto tires	Net	3.65	.....
Motorcycle tires	Net	3.65	.....
Poland	Legal	10.79‡	.....
Portugal	Net	1.60	.....
(Conversion to U. S. currency is based on the latest quotation of the paper milreis.)			
Rumania—Auto tires	Legal	9.06 }	Plus 2%
Solid tires	Legal	4.90 }	ad valorem
Servia	Net	13.16	.....
Spain—Solid tires	Net	17.51	.....
Casings and inner tubes	Net	23.64	.....
Sweden—Auto tires	Net	14.59	.....
Solid tires	Net	9.73	.....
Switzerland—Auto tires	Gross	0.44	.....
Solid tires	Gross	0.69	.....
Turkey	.....	15.00	.....
United Kingdom	.....	.....	Free
ASIA:			
British—			
Aden	.....	.....	Free
Ceylon	.....	.....	7.5
(Duty based on wholesale cash price in bond, less trade discount at the port of entry.)			
Cyprus	.....	.....	10
(Duty based on export price with addition of cost of transport [including insurance] to the port of final discharge.)			
Federated Malay States	.....	.....	10
Hongkong	.....	.....	Free
India	.....	.....	7.5
(See note for Ceylon.)			
North Borneo	.....	.....	10
Sarawak	.....	.....	Free
Straits Settlements	.....	.....	Free
China	.....	.....	5
Chosen (Korea)	.....	.....	8
(After August, 1920, the Japanese tariff applies.)			
Dutch East Indies	.....	.....	10
French Indo-China	.....	.....	.....
(Imports from France are admitted free of duty, while imports from other countries are subject to the rates prescribed by the customs tariff of France.)			
Japan (including Formosa)—Auto tires	.....	.....	25
Cycle tires	Net	$42.92	.....
Persia	.....	.....	10
Siam	.....	.....	3
Syria	.....	.....	11% + 1% if imported through Egypt.
AFRICA:			
Abyssinia	.....	.....	10
Belgian Congo	.....	.....	10

* When imported from the United Kingdom, Canada or Newfoundland, admitted at a reduction of one-fifth of the duty. The cost of packing is excluded, except in Dominica, St. Lucia and Grenada, where it is included.

† A surtax of 10 per cent is included.

‡Conversion made at normal rate of exchange.

COUNTRIES.	Weight.	Rate per 100 Pounds, U. S. Currency.	Rate Per Cent—Ad Valorem.
British—			
Mauritius	.....	.....	12
Nigeria	.....	.....	Free
Union of South Africa	.....	.....	20
(Duty based on the current value for home consumption at the place of purchase, including value of packing and agent's commission if it exceeds 5 per cent.)			
Zanzibar	.....	.....	7.5
(The dutiable value of imports from Europe or America is taken to be the cost price [with charges], increased by 5 per cent or the invoice price [exclusive of charges], increased by 15 per cent.)			
Egypt	.....	.....	8
(In Alexandria a wharfage tax of one-half of 1 per cent is added. At other ports different rates are imposed.)			
French Algeria	.....	.....	.....
(Imports from France are admitted free of duty, while imports from other countries are subject to the rates prescribed by the customs tariff of France.)			
Italian—			
Eritrea	.....	.....	8
Libia	.....	.....	11
Somaliland	.....	.....	15
Liberia	.....	.....	12.5
Morocco	.....	.....	12.5
OCEANIA:			
British—			
Australia	.....	.....	35
(Duty based on fair market value F. O. B. at port of export, plus 10 per cent. On casings weighing over 2½ pounds and inner tubes over 1 pound each, 48.6 cents per pound, if higher than the ad valorem rate.)			
New Zealand	.....	.....	1
Guam	.....	.....	Free
(Imports of foreign origin are taxed 25 per cent of their value.)			
Philippine Islands	.....	.....	Free
(Imports of foreign origin are taxed 25 per cent of their value.)			
Tutuila	.....	.....	10

Legal weight is not uniformly construed, but generally includes the weight of the immediate packing or container, though in some countries fixed tare allowances are made.

A Rapid Method for the Determination of Sulphur in Rubber Mixtures.[1]

By G. D. Kratz, A. H. Flower and Cole Coolidge.

THIS INVESTIGATION was primarily undertaken in order to find an accurate and rapid method for the determination of sulphur in rubber mixtures, applicable to both vulcanized and unvulcanized samples containing various amounts of sulphur. Further, it was desired that the results obtained should be comparable with those obtained by the well known Carius method, or the fusion method of Waters and Tuttle[2], as adopted by the United States Bureau of Standards. Both of the preceding methods, while accurate, involve a somewhat tedious procedure.

CLASSIFICATION OF METHODS.

It will not be necessary to review all of the methods which have been proposed for the determination of sulphur in rubber. Without considering their priority, it will suffice to recall that they can be grouped roughly under three general classifications—direct fusion, solution with electrolytic oxidation and solution, or wet oxidation, with or without subsequent fusion.

Of the direct fusion methods, the use of Eschka's mixture, as proposed by Esch[3], and the zinc oxide-potassium nitrate fusion mixture, proposed by Kaye and Sharp[4], are the best known. The former, although quite accurate, is not sufficiently rapid for general analytical work, while the spurting occasioned by the fusion of rubber with zinc oxide and potassium nitrate is a serious objection to the latter.

The electrolytic oxidation method of Gasparini[5] has been adapted especially for rubber by Hinrichsen[6] and by Spence and Young[7]. The latter modification, in particular, gives very satisfactory results, but requires the use of special apparatus, the installation of which is not warranted in all laboratories.

The method of Henriques[8], however, which involves wet oxidation and subsequent fusion, probably has received the most attention and has been made the subject of the greatest number of modifications, among which is that of Waters and Tuttle. The subsequent fusion of the product of the oxidation with nitric acid with sodium carbonate-potassium nitrate mixture, however, limits the rapidity with which this determination can be made. Several methods have been devised to avoid the use of a fusion mixture. The best of these have been proposed by Roth[9], Stevens[10], and by Rosenstein-Davies[11]. Stevens' method, which has appeared since the results reported in this paper were obtained, has not been compared with our own. It would appear, however, that in it Stevens has modified Roth's method in such a manner that the objections to the latter method, noted by the Netherlands Government Institute, have been largely eliminated. The Rosenstein-Davies method is based, primarily, upon the solution and wet oxidation of the rubber by a nitric acid-bromine water mixture. In order that this oxidation be complete, and the necessity of subsequent fusion be eliminated, it is required that the oxidation be effected at a higher temperature than it is possible to obtain by heating with nitric acid and bromine water alone. To elevate the boiling point, a quantity of arsenic acid is added.

Our experience with the above method has led us to depreciate the use of arsenic acid for the purpose intended. When employed in the recommended quantity (12.5 gms.), it is difficult to remove it entirely from the barium sulphate precipitate. Consequently, in our method, in order to elevate the boiling point, with a substance which can be easily washed free from the final precipitate, we have substituted zinc oxide for arsenic acid. This substitution, while it effects even a higher elevation in the boiling point than is obtained with arsenic acid, has the further advantage of permitting the subsequent fusion being carried to dryness; in the case of the Rosenstein-Davies method, evaporation is continued to syrupy consistency only. Thus, the carrying to dryness, or, as we have termed it, "baking" of the residue, insures a more complete oxidation than is obtained by the above method, and the final oxidation takes place at a temperature far in excess of the boiling point of arsenic acid. After "baking," the residue is taken up in hydrochloric acid, and the zinc is eliminated—as the readily soluble chloride which is easily washed from the barium sulphate precipitate.

In applying our method, we have found the following procedure to give excellent results:

[1] Published by courtesy of the American Chemical Society. Paper read before the Rubber Division of the American Chemical Society, at Philadelphia, Pennsylvania, September 2-6, 1919.

[2] "Journal of Industrial and Engineering Chemistry," Vol. 3, 1911, page 734.

[3] "Chemiker Zeitung," Volume 28, 1904, page 200.

[4] "The India-Rubber Journal," Volume 44, 1913, page 1189.

[5] "Gazetta Chimica Italiana," Volume 37, No. II, 1907, page 426.

[6] "Kolloid Zeitschrift," Volume 8, 1911, page 248.

[7] "Journal of Industrial and Engineering Chemistry," Vol. 4, 1912, p. 413.

[8] "Zeitschrift Angewandter Chemie," Volume 34, 1899, page 802.

[9] "Communications of the Netherland Government Institute for Advising the Rubber Trade and the Rubber Industry," Volume V, page 144.

[10] "Analyst," Volume 43, 1918, page 377.

[11] "Chemist Analyst," Volume 15, 1915, page 4.

THE METHOD IN DETAIL.

The sample, weighing about 0.5 gm., is cut finely with scissors, or is crumbled on the mill, and transferred to a 500 cc. Erlenmyer destruction flask (Pyrex glass).[12] Ten cc. of the zinc oxide-nitric acid[13] solution is added and the flask whirled rapidly to thoroughly moisten the sample. If convenient, the mixture may be allowed to stand over night at this point. By so doing the sample becomes partially decomposed, which permits the addition of fuming nitric acid with no danger of ignition of the sample. Fifteen cc. of fuming nitric acid is then added (all at once) and the flask whirled rapidly to keep the sample immersed in the solution in order to avoid ignition by too rapid oxidation.

With certain samples, it may be necessary to cool the flask under a stream of tap water. When the solution of the rubber is complete, five cc. of a saturated water solution of bromine is added and the mixture is evaporated slowly to a foamy syrup[14]. If particles of organic matter remain at the end of the evaporation, a few cc. of fuming nitric acid are added and the solution is reevaporated to the same consistency as before. The flask is then cooled and a few crystals of potassium chlorate are added to assist in the oxidation of the sulphur and the decomposition of any nitrates.

The mixture is then evaporated to dryness over a Tirrill burner, using an asbestos gauze. While in this position, the contents of the flask is baked at the highest temperature of the burner, until all nitrates are decomposed and no more nitrogen peroxide fumes can be detected[15]. When the "baking" is complete, the flask is cooled and the residue taken up with fifty cc. of (1:6) hydrochloric acid and heated until solution is complete[16]. The solution is then filtered, made up to 300 cc., and precipitated with barium chloride in the usual manner, observing the customary precautions. The barium sulphate precipitate is washed with boiling water until no cloudiness results on testing the filtrate with silver nitrate solution.

DISCUSSION OF THE METHOD.

It was desired to employ the minimum quantity of zinc oxide necessary to effect the complete oxidation of the rubber and sulphur. Several preliminary tests were made with different amounts of this substance. Best results were indicated with two gms. of zinc oxide to ten cc. of nitric acid. The use of these quantities was confirmed by the results obtained for the combined sulphur in a rubber mixture which contained 1.903 per cent sulphur, when estimated by the method of Waters and Tuttle.

Sample No.	Grams Zinc Oxide Used.	Combined Sulphur, Per Cent.
292	1	1.712
292	2	1.907

From this, it is evident, that with less than two gms. of zinc oxide the results obtained are apt to be low.

The barium sulphate precipitates obtained by our method were then examined qualitatively for the presence of zinc. The "Rinmann Green" test for zinc gave negative results, indicating the absence of this substance as an impurity. The true barium sulphate contents of the barium sulphate precipitates obtained by our method were also determined quantitatively in the following manner. The combined sulphur on a sample of rubber was estimated in the usual way. The barium sulphate precipitate so obtained was then fused with one to one sodium carbonate-potassium nitrate mixture, the melt dissolved in water, filtered, acidulated with hydrochloric acid and the sulphates reprecipitated. This determination was carried out in duplicate, and the results are tabulated below. From these results, it is apparent that the difference between the two, when expressed as "per cent sulphur," is negligible, showing that the barium sulphate, as originally precipitated, is practically free from impurities.

Sample	Original Precipitate Barium Sulphate in Grams.	Sulphur, Combined Per Cent.	Fused and Barium Sulphate Reprecipitated in Grams.	Sulphur, Combined Per Cent.
A	0.0805	2.040	0.0781	1.979
B	0.0801	2.030	0.0781	1.979

The possibility of error from the foregoing sources having been determined and found to be negligible, sulphur estimations were made on several different mixtures. In all instances, unless otherwise stated, the mixture subject to analysis was composed of 92½ parts rubber and 7½ parts sulphur. The condition of the mixture, and the nature of the sulphur (total or combined) was varied acording to the experiment.

Our inability to readily obtain satisfactory results for the total sulphur in mixtures composed of rubber and sulphur only, by methods not employing subsequent fusion, led us to first examine mixtures of this type. The total sulphur, as estimated by our method, in both unvulcanized and vulcanized mixtures, was found to be in good agreement with the quantity originally added. In the case of unvulcanized samples, however, we found it best to employ the modification recommended in foot-note 14. Typical results for total sulphurs are tabulated in Table I.

To test the accuracy of our method for the determination of combined sulphur, results obtained by it were compared with similar determinations made by the method of Waters and Tuttle. The results of this comparison are shown in Table II, and are such as to require no comment in regard to them.

TABLE I.

Sample No.	Condition of the Mixture.	Sulphur Added to the Mixture, Per Cent.	Sulphur Found, Per Cent.
321	Unvulcanized	7.5	7.439
348	"	7.5	7.576
597	"	7.5	7.462
288	Vulcanized	7.5	7.551
444	"	7.5	7.498
477	"	7.5	7.498

TABLE II.

Sample No.	Per Cent Combined Sulphur, Method of Waters and Tuttle.	Per Cent Combined Sulphur, New Method.
275	1.960	1.940
277	2.070	2.140
278	2.180	2.140
279	1.960	2.020
280	1.990	2.020
292	1.888	1.898

TABLE III.

Sample No.	Per Cent Sulphur Added to Mixture.	Per Cent Free Sulphur by Bromine-Oxidation Method.	Per Cent Combined Sulphur by New Method.	Per Cent Total Sulphur by Addition.	Per Cent Total Sulphur by New Method.
390	7.5	5.736	1.792	7.528	.....
398	7.5	5.714	1.726	7.440	.....
399	7.5	3.928	3.638	7.566	.....
400	7.5	4.371	3.100	7.471	.....
444	7.5	4.194	3.210	7.404	7.498
477	7.5	4.194	3.256	7.450	7.498

TABLE IV.

Sample No.	Mineral Pigment Added to Mixture.	Per Cent Sulphur Added to Mixture.	Per Cent Free Sulphur by Bromine-Oxidation Method.	Per Cent Combined Sulphur by New Method.	Per Cent Total Sulphur by Addition.	Per Cent Total Sulphur by New Method.
361	Zinc Oxide	2.56	0.893	1.664	2.557	.....
466	Zinc Oxide	2.56	0.740	1.801	2.541	.....
483	Zinc Oxide	3.75	2.486	1.221	3.707	3.830
524	Litharge	7.14	....	....	....	7.188

The figures shown in the Tables I and II were further substantiated by those recorded in Table III. From this table, it is also evident that satisfactory results may be expected when our method is employed for the determination of combined and total sulphur in conjunction with the bromine oxidation method of the United States Bureau of Standards[17] for the determination of free sulphur.

[12] We have found the heavy type Pyrex flask to be remarkably satisfactory at the high temperature at which the baking takes place.

[13] 200 gms. chemically pure zinc oxide in 1 liter of concentrated chemically pure nitric acid.

[14] For the determination of the total sulphur in unvulcanized mixtures, use 3 cc. of bromine in place of the above quantity of bromine water.

[15] Some care should be used at this point to insure uniform penetration of the heat throughout the contents of the flask, and to remove the flask as soon as the "baking" is complete.

[16] In case the original mixture contains barium salts, they will be precipitated at this point. If litharge is present in the mixture, lead salts, not otherwise removed, will be eliminated in the final washing with boiling water.

[17] Circular of United States Bureau of Standards, No. 38, 1915, page 66.

In Table IV we have given a few figures obtained with mixtures which also contained a mineral substance. The results for these mixtures require no comment.

SUMMARY.

Briefly, our method, as herein described, differs from others which eliminate subsequent fusion with sodium carbonate-potassium nitrate mixture, chiefly in the introduction of a process whereby the products of the initial oxidation are "baked" in the presence of zinc oxide. By this means, complete oxidation and the expulsion of oxides of nitrogen are insured. We have found it to be accurate to within 0.1 per cent as compared with the method of Waters and Tuttle. A further advantage which increases both the accuracy of the method and the rapidity of its manipulation is that it does not require the transference of the contents of the flask in which the determination is made until the precipitation of the barium sulphate is to be effected.

We have found that from thirty to fifty determinations can easily be made, by our method, by one man in a week's time. Incidentally, the quantity of nitric acid required is small, in comparison with other methods.

In conclusion, we strongly recommend the determination and subtraction of a blank, to allow for sulphur in the combined reagents employed[10]. This applies, not only to our own method, but, likewise, to any other method as well.

In view of the results recorded above, we are warranted in drawing the following conclusions:

CONCLUSIONS.

1. It is possible to obtain complete oxidation by our method of procedure, which involves baking the residue in the presence of zinc oxide.

2. The results obtained by our method for combined sulphur (as compared with those obtained by the method of Waters and Tuttle), or for total sulphur (as compared with the amount added to the mixture), are accurate to within 0.1 per cent.

3. The rapidity and accuracy with which sulphur determinations can be made by our method recommends its use for routine work in the rubber laboratory.

[10] Our experience with a number of different methods, particularly if used to estimate combined sulphur when present in small amount, has caused us to emphasize this point. It is possible that the subtraction of a blank for the reagents used would have lowered considerably the figure (0.18 per cent) obtained by Fol and Van Heurn ("Communications of the Netherlands Government Institute for Advising the Rubber Trade and the Rubber Industry," Part VI, page 184) for the unextractable sulphur in an unvulcanized mixture. With the best obtainable reagents, blanks will run from 0.05 to 0.15 per cent, according to the method and reagents employed. On repeating the work of Fol and Van Heurn, wherein we extracted the unvulcanized mixture with acetone for twenty-four hours, we obtained a combined sulphur of 0.067 per cent after the subtraction of a blank for the re-agents.

PLANTATION RUBBER, A FORECAST.

ASSUMING that the acreage planted in rubber will increase at the rate of increase of the years since the war began, which in round numbers is something under 150,000 acres yearly—in the four previous years it was nearly 300,000 acres a year—the average under plantation rubber for 1919 should be 2,900,000 and for 1920 about 3,050,000 acres. It is possible that falling prices may check extension in the countries in British hands, but any such effort will be offset by increased cultivation in the Dutch possessions and in the lands where experimentation with rubber culture, and, above all, with *Hevea*, has been going on scientifically—Borneo, New Guinea, the Philippines, Cochin China and East and West Africa, British, French and Belgian.

There is an effort to restrict in some degree the indiscriminate collection of rubber, for many reasons and in many ways: by planting fewer trees to the acre and farther apart; by tapping at longer intervals and more sparingly in accordance with the theories of scientific experts, who attribute diseases and other mishaps to the methods of tapping, so that in some places trees are tapped only in alternate years or less frequently, in others only on some fraction of the circumference, in all somewhat less recklessly and profusely; by arbitrarily abstaining from collecting a portion of the crop in order that the stock on the market may be diminished and prices be kept higher in consequence.

This is offset by the fact that only the first trees planted have come to full maturity, and that the younger trees planted a score of years ago are maturing by hundreds of thousands of acres yearly, each tree able to yield more latex every year. The full impact of the planting begun in Malaya twenty-five years ago has not been felt, and the millions of trees planted in other suitable lands also have yet to come to full maturity. The annual supply of crude rubber must increase largely from natural causes even if not a single new tree were planted.

The increased demand for rubber in the United States is likely to continue for years to come. The 100,000 tons called for in 1915 had increased 50 per cent in 1918 and had gone nearly to the 200,000-ton mark in 1919. While the building of automobiles may reach its limit within a few years, it is not likely that their use will be checked and a steady supply of tires must be inevitably provided for them.

While the rubber supply from Brazil, Africa, and other districts may be looked upon as likely to stay at 60,000 tons at the most, unless modern and improved methods are applied, the production of plantation rubber in the Far East can easily be increased by 50,000 tons yearly, if the demand calls for that amount at a fair price. In all probability the eastern plantations could soon send in much more than that amount of rubber, if any emergency should demand it, unless some disaster to the rubber culture should intervene, like the boll weevil devastation of Sea Island cotton.

PLANTATION RUBBER ACREAGE, PRODUCTION AND WORLD'S PRODUCTION.

Year.	Plantation Acreage.	Plantation Production (tons).	Total, World Production (tons).
1900	.....	4	53,890
1901	.....	5	54,850
1902	.....	8	52,340
1903	.....	21	55,950
1904	.....	43	62,120
1905	116,500	145	62,145
1906	294,200	510	66,210
1907	506,550	1,000	69,000
1908	687,350	1,800	65,400
1909	861,150	3,600	69,600
1910	1,122,550	8,200	70,500
1911	1,505,350	14,419	75,149
1912	1,817,350	28,518	98,928
1913	2,021,750	47,618	108,440
1914	2,181,050	71,380	120,380
1915	2,293,750	107,867	158,702
1916	2,458,950	152,650	201,598
1917	2,611,350	213,070	265,698
1918	2,759,950	255,950	*296,579
1919	*2,900,000	285,225	*327,000
1920	*3,050,000	*330,000	*390,000
1921	*3,200,000	*380,000	*440,000
1922	*3,350,000	*430,000	*500,000
1923	*3,500,000	*480,000	*550,000
1924	*3,650,000	*530,000	*600,000
1925	*3,800,000	*600,000	*660,000

*Estimated.

DR. SCHAEFFER VICE-PRESIDENT EAGLE-PICHER LEAD CO.

Dr. John A. Schaeffer, chief chemist and metallurgist of the Eagle-Picher Lead Co., at Joplin, Missouri, for nine years past, was made a vice-president of the company at the annual meeting held in Cincinnati, February 17, with headquarters in St. Louis. He will have, in addition to his scientific duties, full charge of all operations of the company's St. Louis district, which includes the plant at Hillsboro, Illinois, where zinc oxide will be manufactured, and the plant of the Hammar Brothers White Lead Co., recently acquired by the Eagle-Picher company.

Before joining the company Dr. Schaeffer was instructor in chemistry at the Carnegie Institute of Technology at Pittsburgh, Pennsylvania; he is a member of the American Institute of Chemical Engineers and the American Chemical Society. R. E. McCormack, formerly purchasing agent and assistant traffic manager at Joplin, will be his assistant. The offices of the Eagle-Picher Lead Co. are now in the Railway Exchange Building, St. Louis, Missouri.

What the Rubber Chemists Are Doing.

IDENTIFYING ARTIFICIAL RUBBERS.

C. HARRIES discusses the possibility of identifying the presence of artificial or synthetic rubbers in a special contribution in *"Gummi-Zeitung,"* Volume 33, No. 16, January 17, 1919, page 222,[1] and gives his method in detail.

All previous methods for either qualitative or quantitative examination of rubber substance are incapable of distinguishing which kind of rubber is present because all artificial rubbers yield bromides and nitrosites so similar to those of natural rubber that only by tedious examination can the sources of their derivation be distinguished. The only method available is ozonizing. Even this affords quantitative results only indirectly. First, obtain the rubber substance by the methods hitherto used and then by ozonizing or by separation of the ozonate obtained determine how much of the rubber can be regarded as artificial.

The kinds of artificial rubber to be distinguished are the common isoprene rubber and the so-called carbonate of sodium isoprene rubber. To isolate these products and distinguish them the procedure is as follows:

The watery solution obtained in disintegrating the ozonide is steamed in a vacuum until the residuum is of a syrupy consistency. The aldehydes, diketones and formic acids go off with the steam into the distillation. The residue contains the levuline acids, the succinic acids, and sometimes also another crystallizing product, the levuline aldehyde diperoxide, to which generally no attention need be given. The succinic acid, if it is present, crystallizes quickly and can be expressed. The levuline acids distill in a vacuum below 10 to 12 millimeters at a temperature of about 130 to 150 degrees C. and then give, with acetic acid, phenylhydrazine, a well crystallizing hydrazone with a melting point of 108 degrees C.

For the quantitative estimate of the levuline aldehyde the distillation product is mixed with about 5 grams of acetic acid phenylhydrazine and a few cubic centimeters of diluted muriatic acid, when after standing for a day the levuline aldehyde derivate, the phenyl-methyl-dihydro-pyridazine is set free in solid form. This melts, after it has again been decrystallized with alcohol, at 197 degrees C.

To determine the acetonyl acetone the whole mass is distilled with steam, without first separating the pyridazine. The presence of the muriatic acid turns the biphenyl hydrazine derivative of the acetonyl acetone, with the casting off of a molecule of phenyl hydrazine, into anilino-dimethyl pyrrol which is converted into crystal flakes of 90 to 92 degrees melting point, while the phenyl-methyl-dihydro-pyridazine remains behind in slabs. From the quantity of the anilidopyrrol which appears, certain inferences may be drawn as to the derivation of the isoprene rubber. If some anilino-dimethyl-pyrrol is found, it is a pretty sure indication of the presence of artificial isoprene rubber.

It is to be noticed, however, that the dimethyl butadiene rubber ozonides when disintegrated with water also yield acetonyl acetone, namely, normal dimethyl butadiene rubber, in almost an equal quantity, but the converted Kondakow product only 50 per cent of the amount that the theory calls for. With these, however, no succinic acid is found in the residue. Much anilido-dimethyl-pyrrol would point to the presence of the last two materials. If we have clean normal dimethyl butadiene rubber, when its ozonide is separated, we have a watery solution which, mixed with acetic acid phenylhydrazine gives at once a beautiful yellow precipitate of the biphenyl hydrazone of acetonyl acetone, which, when filtered and weighed, enables us to calculate pretty closely the amount of dimethyl butadiene rubber.

[1] "On the Scientific Principles for Identifying Artificial Rubbers by Technical Analysis."

The melting point of the biphenyl hydrazone, decrystallized out of diluted alcohol is, according to Paal around 120 degrees C. Pure dimethyl butadiene rubber is the easiest of all artificial rubbers to detect.

The hardest of the butadiene rubbers to investigate is that whose ozonide in the disintegration yields succinaldehyde. We must proceed in seeking its quality as we do with the isoprene rubbers, namely, steam the watery decomposing fluid in a vacuum. The succinaldehyde passes out with the steam, and gives, when combined with acetic acid phenyl hydrazine, the succinbiphenyl-hydrazone with a melting point of 125 degrees C. This is very decomposable. Treated with diluted muriatic acid it is converted into a solid, white polymeric base, throwing off phenyl-hydrazine which melts at 184 to 185 degrees C.

In mixtures of butadiene rubbers with other kinds of rubber, it is extremely hard to demonstrate the presence of succinbiphenyl hydrazone.

With vulcanized products the procedure would be as follows:

The sample to be investigated in the first place must be freed of sulphur as much as possible. This can be brought about only by rolling the sample thin, wetting the surface, and dissolving it with acetone in a Soxhlet apparatus as long as sulphur is taken up by the solvent. Then, after the extraction has continued for about eight days, the sample is rolled out again and subjected to extraction once more for a like period. The sulphur absorbed only colloidally is thus pretty nearly all removed, and the samples retain only the sulphur that is chemically combined. This, when treated with ozone, is converted into peculiar sulphur acids bound to carbon; free sulphuric acid is also developed. In order that these, when the ozonide is boiled with water, shall not harden the aldehydes and ketones that are formed, a few grams of precipitated calcium carbonate are added to the water beforehand in order to neutralize it. Then when it is steamed in a vacuum, the aldehydes and ketones pass over into the distillation, the acids partially bound to the calcium (levuline acids) must be set free and etherized out of the residue by the measured quantity of sulphuric acid, whereupon it may be isolated by redistillation in a vacuum. The individual substance can then be determined as shown above. This method, however, can be used for soft rubbers only and not for hard rubbers.

In conclusion, the author states regarding his method for identifying artificial rubbers that it is still imperfect, but there seems no other possible way at present. The analytical solution of the problem must be accompanied by thorough mechanical tests which presupopse exact knowledge of the physical qualities of the individual materials. During the past few years practical results have been obtained in the identification of series of artificial rubbers submitted for test.

DETERMINATION OF THE SOFTENING POINT OF ASPHALTUM AND OTHER PLASTIC SUBSTANCES.

The following method by D. W. Twiss and E. A. Murphey is from a paper published in the "Journal of the Society of Chemical Industry," December 15, 1919, page 405T.

Substances of the asphaltum type are employed widely in chemical industry under various names, such as gilsonite, grahamite, pitch, elaterite, albertite, bitumen, "mineral rubber," and "hydro-carbon," and as the differences in chemical composition are relatively slight, physical tests become of correspondingly greater importance.

The absence of any definite point of fusion renders all the so-called melting-point methods of examination really methods

for the comparison of the tendency to soften with rise of temperature. Probably the method most commonly applied is that of G. Krämer and C. Sarnow, in which a core of the bituminous material in a glass tube is submitted to the pressure of a drop of mercury of definite weight and the temperature is measured at which the mercury forces its way through the material. This method is probably the most satisfactory but possesses some disadvantages for the avoidance of which the arrangement represented in Fig. 1 is very convenient. The apparatus consists of a U-tube *M* one arm of which is connected by capillary tubing with a gun-metal tap *T*. The central plug of this tap, which forms the most important part of the apparatus, has a conical or tapered bore ¼-inch in length and ⅛ and 1/16-inch in diameter, respectively, at the two ends; the bore is terminated at each end by a flat groove (see Fig. 2) to which its axis is perpendicular; the capillary metal tube of the tap is connected with the glass capillary by means of a well sealed metal sleeve.

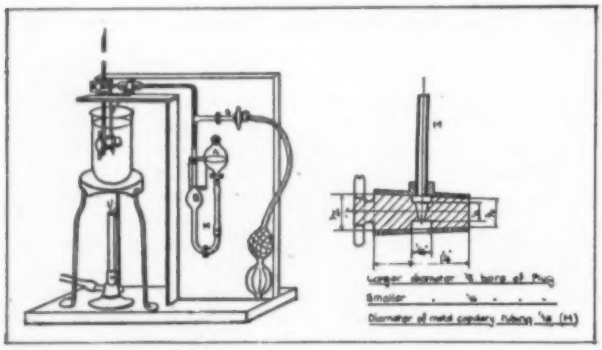


FIG. 1. TESTING SOFTENING POINTS OF ASPHALTS.

FIG. 2. DETAILS OF TAP T.

To perform a test the sample of bituminous material and the clean plug of tap *T* are warmed in a steam oven for about 10 minutes so that the material becomes somewhat plastic; a piece of the softened material is then pressed into the wider end of the bore of the warm tap plug, as expeditiously as possible, with a small spatula, until the bore is filled throughout and a little extrudes from the other end; the tap plug is then allowed to cool and the excess of material removed carefully so as to leave the exposed surfaces of the material flush with the metal at the end of the bore. The plug is then refitted into its seating in the barrel, being previously lubricated if necessary with a smear of glycerin. From the principle of the test it is essential that the narrower end of the bore should face downwards and be directly above the free opening of the barrel of the tap. Sufficient mercury is present in the U-tube to reach approximately to the equator of the bulb *A* when the pressure is the same in each limb. Air is then forced gently through the tap *S* until the U-tube, acting as a manometer, indicates an excess internal pressure of 1½ inches of mercury between the two limbs. The tap *S* is then closed, when, if the apparatus is properly fitted, the internal pressure remains constant. On warming the medium in the bath, with the usual precautions, a temperature is finally attained at which the air pressure is sufficient to cause the complete extrusion of the core of bituminous material through the narrower end of the bore of the tap plug; the attainment of this temperature is indicated sharply by the sudden rise of the level of the mercury above *B*, and the reading of the thermometer is recorded as the softening point of the material.

The flat grooves cut at the two ends of the tapered bore of the plug of the tap *T* not only facilitate the filling of the bitumen and enable a considerable degree of accuracy in fixing the length of the bituminous core, but also, at the narrower end, provide a convenient space to receive the extruded bitumen so that the subsequent removal of the plug from the barrel is possible without difficulty.

The bulbs *A* (diameter approximately 1¼ inches) and *B* (diameter approximately ¾ inch) are so arranged that any expansion of the air enclosed between *T* and *B*, due to heat received from the bath despite the interposed screen, causes no appreciable alteration in the difference between the mercury levels. The pressure, therefore, is practically constant until the extrusion of the bitumen at the end of the determination. For a second test it is merely necessary to remove the plug of tap *T* and to clean it with a camel-hair brush (or a piece of filter paper) moistened with carbon bisulphate; the apparatus can therefore be kept fitted up ready for immediate use. Any gradual discoloration of the heating medium is of no consequence to the performance of the test. The construction of the tap *T* in metal facilitates the transference of heat to the central core of bitumen and so reduces the "lag" of its temperature behind that recorded by the thermometer. For the heating medium in the bath, glycerin is generally convenient. As the commercial products of the asphalt type have generally been already well mixed when in a fluid condition, the smallness of the sample tested is not detrimental.

The results obtained with the apparatus described above are generally higher than those obtained with the Krämer-Sarnow method, and the essential difference between the two methods of testing the softening is reflected in the fact that, although both methods give concordant results, we have found the difference between the results of the two methods for various materials to range from 5 degrees to 30 degrees C.

In the following table is given the range of the readings obtained with various commercial samples which were tested repeatedly with the described apparatus and by the Krämer-Sarnow method; the first four samples were probably of gilsonite, whilst the fifth was of a coal-tar pitch.

Sample.	Softening Points. Above Extrusion Method. Degrees C.	Softening Points. Krämer-Sarnow Method. Degrees C.
1	155—157	138—140
2	145—147	127—129
3	146—147	124—126
4	179—181	148—150
5	94— 95	87— 88

It is evident that the apparatus described above will also be of very considerable utility for the comparison of the softening points of other materials, such as gutta percha, balata, etc., which exhibit a similar gradual softening when heated. The relative behavior of various grades of gutta percha and balata towards heat is of great importance for some purposes. On account of the lack of adhesion between glass and gutta the Krämer-Sarnow method is not satisfactorily applicable, whereas our experiments using the method described above have given clear indication of its trustworthiness for this additional purpose. The significance of the test is manifest from the fact that although consistent results are obtainable with various commercial samples, the softening temperature observed ranged from 101 degrees C. for a sample of washed raw balata, to 190 degrees C. for a commercial sample of so-called "pure gutta." It is essential, however, that the portions used for the test should previously be rendered air-free and dry. In making these experiments the same "head" of mercury was used as was mentioned earlier for asphalt materials, but in the comparative examination of balatas or guttas it might be advisable in some cases to apply a greater pressure.

DR. L. J. H. STADHOUDER HAS DISCOVERED A METHOD OF COAGULATING latex without making use of any coagulating material. Samples of his rubber are being tested scientifically at the Central Rubber Station at Buitenzorg and also at the *Nederland-Indisch Caoutchouc Fabrik* at Bandoeng.

CHEMICAL PATENTS.

THE UNITED STATES.

WATERPROOFING COMPOSITION. One gallon neat's-foot oil, eight pounds rubber, one pound tallow, eight ounces beeswax, four ounces resin and one ounce Burgundy pitch. (Daniel Jewett Davies, Pasadena, California. United States patent No. 1,329,162.)

THE DOMINION OF CANADA.

RUBBER RECLAIMING PROCESS comprising simultaneously treating the material to be devulcanized under proper conditions of heat and pressure with a devulcanizing agent comprising xylol and aniline in the proportions of 2½ per cent of aniline and ten per cent of xylol in the presence of a substance capable of combining with or absorbing sulphur. (Firestone Tire & Rubber Co., assignee of John Young, both of Akron, and Winthrop W. Benner, Cuyahoga Falls—all in Ohio, U. S. A. Canadian patent No. 195,875.)

DECORATED RUBBER ARTICLE. The method of making a decorative rubber article by compounding a mass of unvulcanized rubber with a light-sensitive material, forming the compound into the article desired, and subjecting the surface of the article to light rays conforming with the desired design, and then subjecting the article to the action of heat. (The Canadian Consolidated Rubber Co., Limited, Montreal, Quebec, Canada, assignee of Albert A. Somerville, New York City. Canadian patent No. 196,143.)

PAVEMENT COMPOSITION in the form of a block or tile composed of peat, bitumen, marine glue, and slaked lime, transformed by heat to a thick paste and subsequently compressed in a press. (Eugene Audit, Montreal, Quebec, Canada. Canadian patent No. 196,210.)

RUBBER RECLAIMING PROCESS for the separation of cotton fiber or the like from rubber waste which comprises the steps of wetting the waste, passing the waste under a roller and feeding it gradually to a high speed picker whereby the fabric is torn from the waste in the form of threads and fibers and the rubber is torn into small particles, throwing the cotton and rubber together from the picker and separating the cotton from the rubber by blowing the cotton out of its normal course. (The Acushnet Process Co., Inc., New York City, assignee of Philip E. Young, Fair Haven, Massachusetts, U. S. A. Canadian patent No. 196,380.)

RUBBER VULCANIZATION. A process for neutralizing the sulphurous and sulphuric acids and their anhydrous and gaseous forms, generated by the oxidation of the rubber in vulcanized rubber goods having a foundation of fabric, immediately after dry vulcanization is finished and before the goods have cooled, which consists in subjecting the goods to a suitable heat and treating them in an hermetically sealed chamber with undiluted ammonia gas under pressure.

Another claim covers associating with the components of the goods, ingredients which are capable of emitting a gaseous reagent which has a strong neutralizing activity but no prejudicial effect on fabric, rubber, or process of vulcanization. (William Edgar Muntz, London, England. Canadian patent No. 196,564.)

THE FRENCH REPUBLIC.

ACCELERATION OF VULCANIZATION. A process for accelerating the vulcanization of rubber. J. F. B. Van Hasselt. (French patent No. 495,284.)

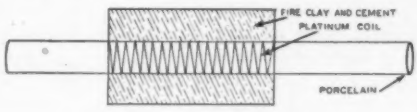
VULCANIZING RUBBER. A process for vulcanizing rubber and similar substances, and the product resulting from it. The North British Rubber Co., Limited. (French patent No. 496,220.)

VULCANIZING RUBBER. Improved method of vulcanizing rubber and similar substances. (The Dunlop Rubber Co., Limited, Birmingham, England. French patent No. 497,327.)

LABORATORY APPARATUS.

ELECTRICALLY HEATED COMBUSTION TUBES.

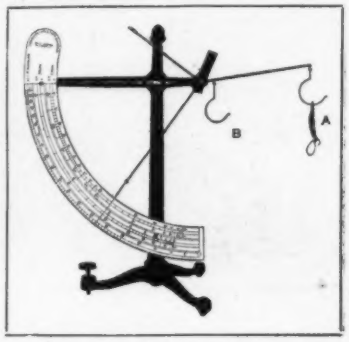
A COMBUSTION tube that is heated electrically has been designed by C. B. Clark, as shown in the accompany illustration. The tube is of porcelain 24 inches long and 0.4-inch internal diameter. The heating element consists of a coil of platinum wire, insulated by fire clay and cement and provided with copper terminals.



ELECTRICAL COMBUSTION TUBE.

INSTRUMENT FOR DETERMINING YARN NUMBER AND WEIGHT OF COTTON CLOTH.

The accompanying illustration shows a device known as a yarn and cloth quadrant, designed for accurately and conveniently determining the number of cotton yarn and the weight of cotton cloth.



YARN AND CLOTH QUADRANT.

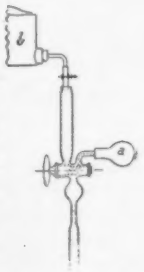
Numbers of yarns from one to ten are determined by placing on hook *B* of the quadrant 40 lengths of either warp or filling yarn, drawn from a sample cut to the size of a template accompanying the instrument; the pointer will immediately indicate the number of the yarn, on the lower "4-yard scale." For numbers from ten to 100, hook *A* is used.

The weight of cloth in yards to the pound and the percentage of size in cloth can also be readily ascertained by this instrument. (Charles Lowinson, Inc., 366 Fifth avenue, New York.)

PIPETTE USED IN TITRATION OF OILS FOR ACIDITY.

The pipette illustrated is described by J. Jacobsen, Aarhus Oliefabrik, Aarhus, Denmark, in "The Journal of Industrial and Engineering Chemistry," August, 1918.

The oil to be examined is drawn, by means of the rubber bulb *a*, into the lower tube, which has a capacity of 5.5 cc., equivalent to 5 grams of oil. The cock is turned and the upper tube is filled with a suitable quantity (10 cc.) of a mixture of ether and methylated spirit, conveniently taken from a tubulated bottle, *b*, which is located just above the pipette. Then the cock is turned again and the oil, followed by the ether-alcohol mixture, is run into a flask and titrated with alkali. In that way the lower tube is cleaned out automatically and is at once ready for a new sample.



TITRATION PIPETTE.

DIXIE CLAY.

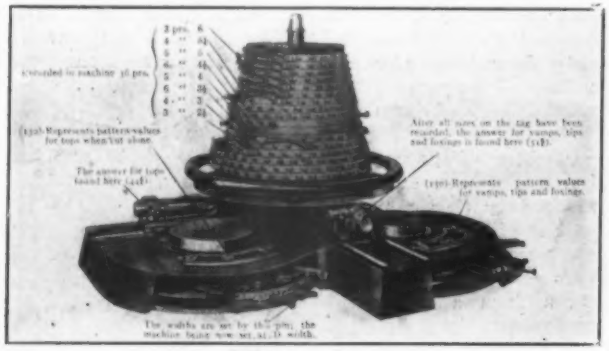
A new compounding ingredient notable for its wear-resisting quality is being offered to manufacturers of tires, footwear, hard rubber, and mechanical rubber goods. It is light in color, mills easily and calenders well in high tensile compounds. (R. T. Vanderbilt Co., Inc., 50 East 42nd street, New York City.)

New Machines and Appliances.

MACHINE FOR CALCULATING FABRIC WASTE IN FOOTWEAR MANUFACTURE.

FIGURING waste percentages on fabric cutting in the rubber shoe industry is a problem which has increased in importance with the rise in price of all kinds of cloth. The method most widely used is to weigh the waste and compute the percentage by either weighing the table of stock before cutting or the cut stock after each performance. The machine here shown has solved this problem for both the leather shoe and the canvas shoe manufacturer. The method involved differs in that it figures in terms of square feet instead of pounds.

To install the service, the manufacturer first sends a model size of each pattern or die, such as men's quarter, size 8, boys'



THE KRIPPENDORF KALCULATOR.

lining, size 5, misses cloth heel, size 13-2, to the laboratory of the machine company for survey. The result of this survey is a pattern value or index which, when computed on the Kalculator, will tell exactly the number of square feet of stock needed to cut out the required number of pairs at the best percentage of waste.

To operate the machine, the pattern value for the model size is set on the indicator. Supposing the ticket to be cut is 36 pairs: 3 pairs, size 6; 4 pairs, size 5½; 5 pairs, size 5; 6 pairs, size 4½; 5 pairs, size 4; 6 pairs, size 3½; 4 pairs, size 3; 3 pairs, size 2½. These sizes and pairs are recorded on the cylindrical dial, the width is set on the scale near the base of the machine, and the answer is found in the center—5¾ square feet. This gives the cutter an accurate goal. He knows that this is the best possible performance.

In cutting leather the general policy is to grade down from the best possible, giving a scale of 8 or 9 performances, leaving it to the manufacturer to decide at which performance he will begin to pay bonus. Leather is so irregular in shape and the quality of different parts of the hides is so varied, that this wide latitude is necessary.

In cutting rubber or canvas duck a scale of 3 or 4 performances is sufficient. The tables of stock are generally uniform in width and length. This makes it desirable to transpose the square feet answer into running feet. Thus, if it requires 51 square feet of stock to cut 36 pairs of vamps, and the tables of stock are 15 feet long and 3 feet wide, it will take 17 running feet of stock or one table and a fraction. The fact that the stocks are laid from 20 to 40 plies in thickness does not complicate matters. The number of pairs in each cut can be easily computed.

There are several advantages of this system over the present methods used in rubber shoe cutting rooms. It eliminates the weighing of waste, stock, and cut stock, all of which takes time and therefore costs money. The only additional equipment it requires is the making of each cutter's table into a scale of feet. A cost clerk can thus very easily complete the cutting record after each performance without moving the stock from the cutters' table. The cost accountant has a reliable figure as to how much stock it takes, including the waste which must go into the cost of the shoe, to cut a pair of every pattern used in all goods from light gum shoes to boots and heavy gaiters. The cutter who has difficult patterns which do not fit or dovetail together well, knows the limits of his patterns, and is not penalized because his percentages are not as low as the cutter who cuts insoles or some oblong shape patterns. The machine is double, thus enabling two patterns to be figured together such as toe tips and fillers.

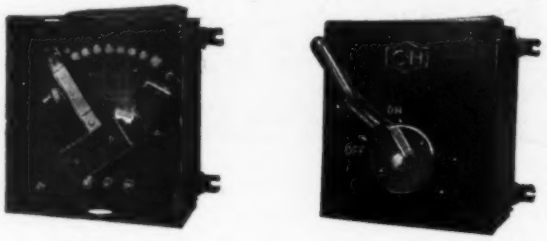
Another advantage of the Kalculator is that it enables the planning department to figure exactly how many running feet of stock the mill room needs to run for each day's ticket. This avoids surplus rolls in the stock room and means less money tied up in unfinished material. (Krippendorf Kalculator Co., Lynn, Massachusetts.)

SAFETY MOTOR STARTERS.

As a safety measure, motor starters should be completely enclosed to protect workmen from coming in contact with live parts. The two safety starters of the enclosed type here shown are therefore of interest.

The first is the familiar type of direct-current face-plate starter enclosed in a sheet metal case having an external lever which engages the movable arm of the starter. The external or operating lever is insulated from the revolving contact arm by a block of molded insulation. A pointer on the lever and legends stamped on the cover indicate whether the starter is "off" or "on." In the smallest size of starter a knob of black insulating composition is provided in place of the operating lever. A low-voltage release coil in series with the shunt field protects the motor in case of voltage failure or if the field should be opened while the motor is running. The armature resistor is completely enclosed in the starter case, which is kept well ventilated by a flue in the top.

This starter is used with direct-current motors up to 50 h.-p., operating at 115, 230 and 500 volts.



OPEN. CLOSED.

FACE PLATE ENCLOSED MOTOR STARTER.

The second is an automatic motor starter panel of the counter-E. M. F. type completely enclosed in a cast iron case with a hinged cover. The automatic feature is obtained by an accelerating contactor which closes when the motor attains about three-fourths full speed, and automatically shunts out the starting resistor. A magnetic main line contactor mounted on the panel allows remote control from two push-button switches of the momentary contact type.

When remote control is not desired the magnetic main line

contactor is omitted, and the motor is started by a fused knife switch mounted on the panel with an operating handle outside of the case. The handle can be locked in the open position to

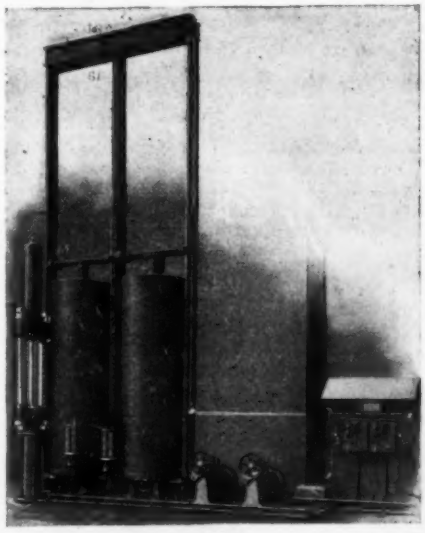
OPEN. CLOSED.

AUTOMATIC ENCLOSED MOTOR STARTER OPERATED BY HANDLE OR PUSH-BUTTONS.

prevent unauthorized operation. Interlocks prevent lifting the cover while the switch is closed or throwing the switch with the cover opened. This starter is for use with small direct-current motors not rated over 2 h.-p. at 115 volts or 3 h.-p. at 230 volts. (The Cutler-Hammer Manufacturing Co., Milwaukee, Wisconsin.)

HYDRAULIC ACCUMULATOR SYSTEM.

The illustration shows a type of hydraulic accumlator installation that is representative of those in use in up-to-date rubber factories. It is a high and low pressure hydraulic accumulator and intensifier system that is automatic in operation and furnishes both high and low pressure to a battery of hydraulic presses without attention from the operators other than the manipulation of the regular press operating valves.



HYDRAULIC ACCUMULATOR.

The high and low pressure triplex hydraulic pumps that furnish the water supply against the pressure of the accumulators are motor driven. Each pump is automatically controlled from an electric switchboard which stops the pump when the accumulator load is raised to a predetermined point and again starts it when the accumulator recedes below this point.

This system has the capacity for developing any pressure from 850 to 10,000 pounds per square inch. (The Hydraulic Press Manufacturing Co., Mount Gilead, Ohio.)

MACHINE FOR MAKING BIAS FABRICS.

Cotton and silk cloth of ordinary square-woven type in which the warp and filler threads are at right angles, may be converted into bias fabrics on the machine here shown. The warp threads remain in their original position but the fillers are inclined at an angle other than 90 degrees to the warp. This is effected by two series of interconnected grippers that grip the fabric edges and being mounted on endless chains, one of which is retarded, the filler threads, while remaining parallel, are drawn into an angular position with regard to the warp; the width of the web being slightly reduced.

The bias web thus produced is impregnated with rubber solution on a spreader, after which two plies are superposed with the bias threads at opposite angles and united by passing through pressure rollers of a doubling machine. The result is a strong, non-raveling bias fabric suitable for the manufacture of rain-

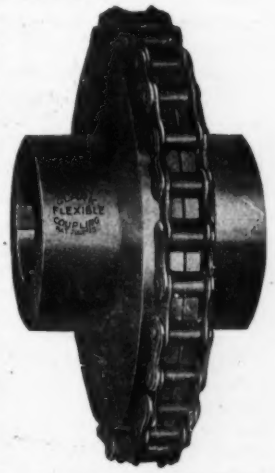
BIAS FABRIC MACHINE.

coats, auto fabrics, imitation leather, mechanical goods, and possibly, tire fabrics. (Albert Herzog, 118 East 25th Street, New York.)

A FLEXIBLE COUPLING FOR MILL LINES.

This coupling is designed for use on shafts where absolute rigidity is not desired and a certain amount of flexibility is required. The device consists of two sprockets rigidly fixed to the ends of the shafts to be connected. An endless chain encircles these sprockets, thereby coupling the ends of the shafts but affording sufficient lateral play to accommodate ordinary differences in shaft alinement.

The smallest coupling of this type transmits less than one-quarter of a horse-power, while the largest weighs three-quarters of a ton and transmits 3200 horse-power. (I. H. Dexter Co., Goshen, New York.)



CLARK FLEXIBLE COUPLING.

A SAFETY INTERLOCKING NUT AND BOLT.

This is a bolt with a nut that it is said will stay locked under all conditions and may be easily unlocked if required. The principle of construction may be seen in the accompanying illustrations. The washer has two extending inner lugs which slide in two lateral grooves extending the full length of the threaded portion of the bolt. The nut, which in the hexagon type has three or in the square nut, four recesses or chucks

formed in the base, is then applied and brought home to the desired point of contact and the washer upset or bent into the

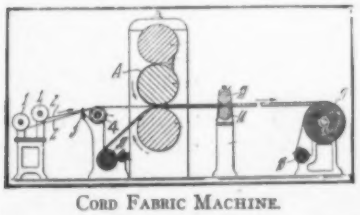
STEVENSON SAFETY BOLT AND NUT.

recess by means of a cape chisel and a hammer blow. For releasing, the upsetting operation is reversed, the same washer being used repeatedly. (The Safety Nut & Bolt Co., 1836 Euclid avenue, Cleveland, Ohio.)

MACHINERY PATENTS.

CORD COVERING AND CORD FABRIC MACHINE.

STRANDS of fabric are covered with rubber and strand fabric for making cord tires is produced on this machine by the calender method, and without crushing or distorting the strands.



CORD FABRIC MACHINE.

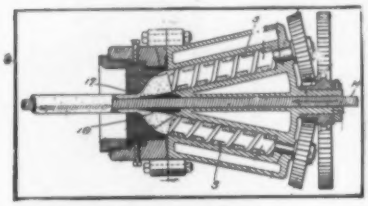
A series of bobbins 1, 1, supply the strands 2, that are alined by comb 3, and grooved roller 4. In passing between the calender rolls, the strands are enclosed, without pressure, between two sheets of rubber, one from the calender roll A, and the other from stock roller 10.

The sheet is thus passed between fluted pressure rollers 13 and 14 that embed the individual strands in the rubber without flattening them, and the completed fabric is then wound up on drum 17 with a liner from drum 18. (Melvon A. Marquette, Springfield, assignor to The Fisk Rubber Co., Chicopee Falls, both in Massachusetts. United States patent No. 1,321,223.)

HOSE MAKING MACHINE.

As shown in the horizontal sectional view, this is a two-screw forcing machine for coating hose with rubber.

In the operation the rubber from the pockets 3 is forced into the die at diametrically opposite sides of the tube H. It flows in both directions about the guide 19 as it moves through the die to the opening 17. Rubber from one screw pocket passes upwardly about the guide 19 while other rubber from the same pocket passes downwardly about the guide. These two bodies of rubber meet corresponding bodies from the second screw pocket at a point substantially midway and, due partly to the reducing diameter of the die and partly to the churning, or agitating, action of the closely juxtaposed screws, the joint between the meeting bodies becomes more or less kneaded. A homogeneous union and an even density is thus secured as the joining bodies are forced out through the opening 17.



TWO-SCREW FORCING MACHINE.

The disposition of the screw pockets at an acute angle relative to the line of feed of the tube H enables the rubber to move toward and through the opening 17 without material change in its general direction of travel. This also increases the efficiency of the device and provides a structure in which no packing is required between any of the moving parts. (John M. Oden, Brooklyn, New York. United States patent No. 1,322,464.)

OTHER MACHINERY PATENTS.

THE UNITED STATES.

NO. 1,327,237. Device for fastening together nested tire casings. C. M. Horton, Elizabeth, N. J., assignor to The Singer Manufacturing Co., New York City.
1,327,264. Single tube pneumatic vulcanizing core. A. O. Alsten, Worcester, Mass.
1,327,307. Tire retreading apparatus. R. A. Brooks, Chicago, assignor to Western Rubber Co., Chicago, a copartnership consisting of said Brooks and G. W. Clark, Oak Park—both in Illinois.
1,327,393. Tire fabric testing machine. A. E. Jury, Newark, N. J., assignor to the United States Tire Co., New York City.
1,327,802. Apparatus and method for manufacturing tires with a spheroidal depression in one surface. J. A. Bowerman, assignor to The Fisk Rubber Co.—both of Chicopee Falls, Mass.
1,327,826. Apparatus for making strand fabric. W. Jameson, Springfield, assignor to The Fisk Rubber Co., Chicopee Falls—both in Mass.
1,327,841. Tire vulcanizer. F. B. Pfeiffer, Akron, O.
1,327,904. Apparatus and process for treating yarn or fabric. W. C. Carter, Radnor, assignor to The Goodyear Tire & Rubber Co., Akron—both in Ohio.
1,327,910. Machine for making tires. W. B. Harsel, assignor to The Goodyear Tire & Rubber Co.—both of Akron, O.
1,328,330. Repair vulcanizer. F. G. Knoflicek, Silvis, Ill.
1,328,676. Tire core. E. A. Krannich, Columbiana, assignor of ½ to L. A. Andregg, Mansfield—both in Ohio.
1,329,239. Device for peeling tires. E. P. Hafner and J. T. Roberts—both of St. Louis, Mo.
1,329,312. Mold for making rubber articles. F. T. Roberts, Cleveland, O.

THE DOMINION OF CANADA.

195,882. Portable repair vulcanizer. The Horsey Products Co., assignee of E. T. Horsey—both of Cleveland, O., U. S. A.
195,906. Apparatus for trimming edges of rubber articles such as boots and shoes. The Wood-Milne, Limited, Manchester, England, assignee of J. Summer, Leyland, County of Lancaster, England.
196,152. Machine for trimming tire casings. Firestone Tire & Rubber Co., assignee of E. D. Putt—both of Akron, O., U. S. A.
196,207. Machine for forming tires. L. P. Arnold, Norwalk, Conn., U. S. A.
196,395. Apparatus for opening tire molds, etc. The Dunlop Rubber Co., Limited, Westminster, County of London, assignee of C. Macbeth, Birmingham, County of Warwick, both in England.
196,396. Apparatus for making solid rubber tires double, then cutting apart. The Dunlop Rubber Co., Limited, Westminster, County of London, assignee of C. Macbeth, Birmingham, County of Warwick—both in England.
196,624. Machine for building pneumatic tire casings. E. Hopkinson, New York City.
196,661. Machine for making tires. The Goodyear Tire & Rubber Co., assignee of W. B. Harsel—both of Akron, O., U. S. A.
195,997. Tire band stretching machine. J. L. Dykes, Chicago, Ill., U. S. A.

GERMANY.

319,301. Scraping knife. Vereinigte Gummifabriken Harburg-Wien, formerly Menier J. N. Reithoffer, Harburg-on-the-Elbe.

THE FRENCH REPUBLIC.

495,103. Apparatus and process for vulcanizing rubber. American Rubber Co.
497,524. Improvements in vulcanizing presses. The Dunlop Rubber Co., Limited.

PROCESS PATENTS.

THE UNITED STATES.

NO. 1,326,991. Manufacture of rubber tires. J. A. Swinehart, Akron, O.
1,328,006. Manufacture of pneumatic cord tires. N. W. McLeod, St. Louis, Mo.
1,328,541. Impregnating and coating fibrous material with rubber. J. F. Palmer, St. Joseph, Mich.
1,329,311. Manufacture of inflated golf balls. F. T. Roberts, Cleveland Heights, assignor to The Aranar Co., Cleveland—both in Ohio.

THE DOMINION OF CANADA.

195,739. Repairing tires. C. C. Gates, Denver, Colo., U. S. A.
195,741. Retreading tires. S. H. Goldberg., Chicago, Ill., U. S. A.
195,926. Retreading tires. S. H. Goldberg, Chicago, Ill., U. S. A.
196,544. Manufacture of pneumatic tire casings. E. Hopkinson, New York City, U. S. A.

THE FRENCH REPUBLIC.

496,020. Improved method of attaching rubber soles to shoes. L. J. Frank.
496,659. Method of fastening valves to inner tubes of bicycles and automobiles. C. J. Fauerbye and S. Alstrup.
496,850. Improved process for manufacturing waterproof products. L. Kirschbraun.
497,363. Improved process for manufacturing non-inflated rubber balls. K. Fukuda, Tokio, Japan.
497,415. Improved manufacture of rubber tires. The Dunlop Rubber Co., Limited.
497,423. Improved construction of solid tires. The Dunlop Rubber Co., Limited.
497,489. Improved construction of inner tubes for pneumatic tires. The Dunlop Rubber Co., Limited.

New Goods and Specialties.

A GLOVE THAT GRIPS.

A PATENTED GLOVE suitable for automobile driving and other uses where it is essential that a firm grip be secured is illustrated in the accompanying picture. It is made of canvas or other fabric, to which is vulcanized a thin membrane of rubber in any form desired. The illustration shows a series of circular gripping surfaces provided on the glove, one large one on the palm and other smaller ones at intervals on the fingers and thumb. These rubber surfaces are ribbed to produce a somewhat roughened contact. The glove may be made with the back open for hot-weather wear. The same idea is also not limited to gloves, but is applicable to mittens as well. (Joseph M. Reynalds, Atlantic, Iowa.)

RUBBER GRIP GLOVE.

TO PROTECT SHOE TOES.

An ingenious device for the protection of the toes of the shoes of bootblacks, chauffeurs, or other persons whose work entails wear on that portion of the shoes, is illustrated herewith.

The cap or crown is formed of rubber vulcanized to a fabric foundation and having the edges turned inward under the sole. Beneath the sole is a piece of woven wire with the edges turned upward and embedded in the rubber. This layer of wire is covered on the outside with rubberized cloth and on the inside with a layer of rubber. The device is held in place by straps which connect with each other and buckle, one around the foot and one from beneath the arch back of the ankle. (Anthony S. Stebor, Jr., 914 George street, Plainfield, New Jersey.)

SHOE PROTECTOR.

A RUGGED CORD TIRE.

The Castle cord tire recently developed, of which a photograph is reproduced herewith, strives for perfection of type coupled with a practical non-skid tread of rugged design.

This tire is the combined result of research and experience in tire manufacturing, with the idea of producing a tire of balanced quality. (New Castle Rubber Co., New Castle, Pennsylvania.)

CASTLE CORD TIRE.

TWO NEW GOLF BALLS.

Those who follow the offerings of the sporting goods dealers to the devotees of golf will be interested in two new dimpled golf balls recently put on the market. They are known as the Eagle No. 1 and No. 2. No. 1 is high-powered, small and heavy, being 1.63 inches in diameter and weighing 1.64 ounces No. 2 is light and soft, is 1.655 inches in diameter, and weighs the same as No. 1, being intended for the average golfer who should not attempt too much weight. (A. J. Reach & Co., Philadelphia, Pennsylvania.)

A RED RUBBER FAN BELT.

A new red rubber belt for the operation of automobile fans has just been put on the market under the name of "Samson." It is made in various sizes to fit practically all cars made or used in Canada, and is put up in boxes containing six of a size, with a label stating the size and the makes of cars which the belt will fit, thus enabling the dealer to lay his hand at any time on any size of belt required for a particular make of car. This belt, it is claimed, will withstand severe tests, one having comprised soaking in cylinder oil for 500 hours at one time. This was done to demonstrate that the tensile strength of the belt is greater than would ever be actually required. (Dunlop Tire & Rubber Goods Co., Limited, Toronto, Ontario, Canada.)

"SAMSON" FAN BELT.

A NEW DUST CAP FOR TIRE VALVES.

A new dust cap for tire valves, known as the "Kwik-on-an-Off," slips over the valve stem and locks with one turn. It remains securely fastened until it is necessary to remove it, when a slight turn in the reverse direction disengages it and permits easy removal. The mechanism is patented and consists of a one-piece shell enclosing a friction spring which fits into the tapered portion of the cap and contracts to grip the threads of the valve stem. (A. Schrader's Son, Inc., 783 Atlantic avenue, Brooklyn, N. Y.)

"KWIK-ON-AN-OFF" DUST CAP.

AN ENDLESS AIR BAG.

The gray endless air bag pictured here prevents damage or marks, it is claimed, to fabric when placed inside tires during vulcanization of retread or recover. A smooth, even pressure is insured to every part of the tire, and separation and blistering are avoided. The bag is of tough, high-grade fabric, coated with a special rubber friction not easily affected by heat. (Firestone Tire & Rubber Co., Firestone Park, Akron, Ohio.)

FIRESTONE AIR BAGS.

A RUBBER GLOVE WITH KNUCKLES.

Surgeons' gloves are now made with allowance for the knuckles, thus, it is claimed, preserving the "cuticle touch" in all its sensitiveness and acuteness at the same time that a perfect-fitting sanitary hand covering is provided. These "KnuklfiT" gloves give free and easy finger action, free circulation of the blood, and eliminate tension on the finger tips. Oversize gloves are no longer required, with their awkward wrinkles and folds. It is also claimed for these gloves that they retain their shape and may be sterilized more times than most other rubber gloves. (The Lincoln Rubber Co., Akron Ohio.)

SURGEON'S "KNUKLFIT" RUBBER GLOVE.

A REINFORCED BLOW-OUT PATCH.

A new kind of blow-out patch is constructed with a layer of wire mesh inserted in the center, embedded in a layer of cushion stock that is vulcanized to fabric on each side. This permits flexibility without separation, while the wire insert resists pressure evenly and affords protection to any rupture in the tire casing. It extends to within three-quarters of an inch of each edge with at least five plies of fabric covering the wire completely. This patch contains from five to nine plies of high-grade fabric, the number being determined by the size.

"DUR-A-BUL" WIRE KNIT BLOW-OUT PATCH AND "EASY-ON" HOLDER.

With these patches is used the "Easy-On" holder, which hooks them around the casing and holds them securely to the sidewall while putting on. The holder is removed after inflation. (Durham Manufacturing Co., 1518 Grand avenue, Kansas City, Missouri.)

PNEUMATIC LIFE SAVING GARMENT.

A convenient inflatable garment intended to be used as a life-preserver is shown in the accompanying photograph. This garment, however, may be worn underneath or over the clothing, as desired. Three seconds is said to be sufficient time for inflating, and, as the garment weighs only ten and one-half ounces and folds up compactly when not inflated, the whole may be carried in the coat pocket.

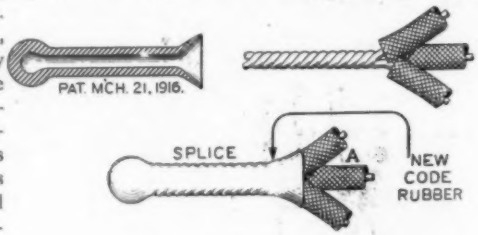
When desired, this garment can be fitted into coats, vests, bathing suits, knitted sweaters and Jerseys, or any other wearing apparel.

GRIFFIN PNEUMATIC LIFE-SAVER.

The inner tube of the Griffin pneumatic life-saving garment is of rubber, and it is claimed that the speedy inflation valve took three years to perfect. (The Griffin Manufacturing Co., 113 State street, Boston, Massachusetts.)

RUBBER SPLICE INSULATOR.

A new kind of insulator for electrical splicing is explained by the accompanying drawing. It consists of a small rubber cap, long and narrow, with an enlarged mouth which permits it to be stretched over end-splices at outlets, in junction boxes and the various fittings of conduit, cable and metal molding work, on terminal splices in motor leads and on splices in fixtures. The use of this device is said to eliminate grounding and entirely prevent short-circuits at end-splices in outlet boxes, etc. Besides, it smoothly covers the rough surfaces of soldered splices and saves time and labor in applying. "Elasticaps" now come in one size, but a larger size is planned to accommodate larger splices such as three No. 14 wires or two No. 10 wires spliced, etc. (The Elasticap Co., Hoboken, New Jersey.)



"ELASTICAP" ELECTRICAL INSULATOR.

AN AUTOMATIC SAFETY TIRE VALVE.

An automatic safety tire valve that "whistles when it's had enough" air has a large hole through the valve stem, from end to end. The inside or check valve seats on top of the stem and is held securely in place, making an air-tight seal by the joining of the stem with the pressure regulator. When sufficient air has been pumped into the tire, a whistle announces the fact, from which the name of the device is derived—the "Whistler." (The Automatic Safety Tire Valve Corp., 1765 Broadway, New York City.)

"WHISTLER" TIRE VALVE.

VALVES AND SQUAWKER ENDS FOR TOY BALLOONS.

Two new valves for toy balloons, on which applications for patents have been made, consist in the main of perforated metal caps, within which are positioned disks of paper. One has three inward-turning tabs, enclosing two disks. (E. J. Dunbar Co., 28 West 22d street, New York City.) The other has a tri-perforated metal insert, enclosing a single disk. (Howe Baumann Balloon Co., 187 Murray street, New York City.)

New squawker ends for toy balloons, turned from wood, slightly ribbed for ornament, and varnished lightly, include two general forms. One has a simple flange over which to fasten the balloon and the other, in addition to the flange, has a groove in which the fastening may lie. (Novelty Turning Co., Norway, Me.)

"PARCO" INNER TIRE.

"PARCO" INNER TIRE.

The inner tire shown here is of sponge rubber to replace the usual pneumatic tube. In this case it is shaped and enclosed in fabric. The "Parco" inner tire comes in different sizes to fit all makes of standard size casings. (The Pan-American Rubber Co., Watertown, Wisconsin.)

Activities of The Rubber Association of America.

ASSOCIATION MEETINGS.

THE REGULAR MONTHLY MEETINGS of the Executive Committees of the Foreign Trade Division, Mechanical Rubber Goods Division, Tire Manufacturers' Division and the Industrial Relations Committee were held during February, but the matters handled were of a routine nature.

TRAFFIC COMMITTEE.

The Traffic Committee is handling with the United States Railroad Administration several matters of importance to the industry, and particularly the application to the Consolidated Classification Committee at Chicago for reduced carload ratings on guayule rubber and the less carload and carload rates on rubber compounds. The Traffic Committee was given a special hearing at Chicago on Friday, February 20, and a favorable decision is expected.

There is now pending before the same committee an application for a reduction from one and one-half times first class to first class on pneumatic tires in less carloads on all kinds of packages, which is a very important subject to the tire manufacturing industry. The application is predicated to a certain extent upon the greatly increased use of paper for the wrapping of tires.

An application is now before the Western Classification Committee at Chicago for a reduction in the ratings on crude rubber from first class L. C. L. to second-class, and from second-class C. L. to fourth class.

An application to the Consolidated Classification Committee is being prepared for the establishment of a rule permitting the mixing of mechanical rubber goods and other general lines of rubber goods in carloads, on the basis of third-class, carload minimum weight thirty thousand pounds. If this application is granted it will have the effect of permitting jobbers to secure complete stocks of goods at a considerable reduction in the present rate and will enable them to order more advantageously.

A recent accomplishment of the Traffic Committee was to secure the adoption in the Virginia State Classification of a provision for the acceptance of pneumatic tires in wrapped bales or bundles. Heretofore the classification was restricted to tires when shipped in crates.

An application will be submitted to the Consolidated Classification Committee for a more flexible provision in the specifications for rubber hose, which will not be so restrictive as to the kind of paper to be used for wrapping hose.

There will be filed shortly with the State Public Utilities Commission of Illinois an application for a reduction in the carload rating on rubber footwear for movement between points in the State of Illinois or points governed by the Illinois State Classification. The present classification provides for first class on this commodity in any quantity and the application asks for a reduction in carload rates to second class minimum, carload weight twenty thousand pounds, the same as applicable in intrastate movements.

ELECTION OF MEMBERS.

The following new members of the Association were elected during the last few weeks:

FIRM MEMBERS.

Ames Holden Tire Co., Limited, Montreal, Quebec, Canada. Firm representative, Talmon H. Rieder.

Emery Manufacturing Co., 43 Main street, Bradford, Pennsylvania. Firm representative, W. A. McCafferty.

Rotary Tire & Rubber Co., Zanesville, Ohio. Firm representative, Edward O. Sterns.

Universal Tire & Rubber Co., San Francisco, California. Firm representative, George M. Stevens.

Duffy & Sears, 133 Front street, New York City. Firm representative, Stephen H. Sears.

Thornett & Fehr, Inc., 66 Broadway, New York City. Firm representative, Henry G. Perry.

Syracuse Rubber Co., Inc., Syracuse, New York. Firm representative, G. R. Loggie.

Trent Rubber Co., Trenton, New Jersey. Firm representative, Henry A. Ludeke.

Hardy & MacArthur, 82 Beaver street, New York City. Firm representative, R. S. Hardy.

Parker Tire & Rubber Co., Indianapolis, Indiana. Firm representative, Paul P. Parker.

Osborn Engineering Co., Cleveland, Ohio. Firm representative, B. L. Green.

ASSOCIATE MEMBERS.

Herbert L. Baxter, Hood Rubber Co.
Robert L. Tonner, Hood Rubber Co.
Robert Muir, Hood Rubber Co.
Robert S. Quinby, Hood Rubber Co.
Edmund S. Kochersperger, Hood Rubber Co.
W. B. Wiegand, Ames Holden Tire Co., Limited.
Claude M. Butler, Syracuse Rubber Co.
William E. Greer, Syracuse Rubber Co.

STANDING COMMITTEES FOR 1920-1921.

NOMINATING COMMITTEE.

The following committees have been appointed by the Executive Committee of the Association:

Harvey S. Firestone, Firestone Tire & Rubber Co.
George B. Hodgman, Hodgman Rubber Co.
Bertram G. Work, The B. F. Goodrich Co.
Frederic C. Hood, Hood Rubber Co.
Henry C. Pearson, THE INDIA RUBBER WORLD.

SPECIAL JOINT EXCISE TAX COMMITTEE.

Charles Neave, chairman.
Kennedy M. Thompson, United States Rubber Co.
F. C. VanCleef, The B. F. Goodrich Co.
Bernard M. Robinson, Firestone Tire & Rubber Co.
C. L. Landon, The Goodyear Tire & Rubber Co.
W. B. Stratton, The Fisk Rubber Co.
J. C. Weston, Ajax Rubber Co., Inc.
F. I. Reynolds, Empire Rubber & Tire Corp.
A. A. Garthwaite, Lee Rubber & Tire Co.
W. E. Pouse, General Tire & Rubber Co.
E. S. Hochersperger, Hood Tire Co.
Herbert H. Maas, Ajax Rubber Co., Inc.

STATISTICAL COMMITTEE.

R. S. Butler, United States Rubber Co.
W. C. Arthur, The B. F. Goodrich Co.
E. M. Bogardus, The Fisk Rubber Co.

LEGISLATIVE COMMITTEE.

Charles Neave, chairman, general counsel of The Rubber Association of America, Inc.
F. C. Van Cleef, The B. F. Goodrich Co.
Ernest Hopkinson, United States Rubber Co.

AUDITING COMMITTEE.

F. A. Seaman, Kelly-Springfield Tire Co.
W. J. Kelly, Poel & Kelly.

ARBITRATION COMMITTEE.

Horace DeLisser, chairman, Ajax Rubber Co., Inc.
Andrew H. Brown, Meyer & Brown, Inc.

George A. Ludington, The Fisk Rubber Co.
Van R. Cartmell, Kelly-Springfield Tire Co.
A. B. Jones, The B. F. Goodrich Co.
J. T. Johnstone, J. T. Johnstone & Co., Inc.
W. T. Baird, Rubber Trading Co.
Homer E. Sawyer, ex-officio, United States Rubber Co.

BANQUET COMMITTEE.

Horace DeLisser, chairman, Ajax Rubber Co., Inc.
A. W. Warren, Hodgman Rubber Co.
C. W. McLaughlin, Mohawk Rubber Co.

OUTING COMMITTEE.

A. H. Brown, chairman, Meyer & Brown, Inc.
G. A. Ludington, The Fisk Rubber Co.
W. O'Neil, General Tire & Rubber Co.

SPECIAL COMMITTEE ON UNIFORM CRUDE RUBBER CONTRACT AND NOMENCLATURE.

Col. H. Stuart Hotchkiss, chairman, United States Rubber Plantations, Inc.
W. E. Bruyn, L. Littlejohn & Co., Inc.
George B. Hodgman, Hodgman Rubber Co.
Frederic C. Hood, Hood Rubber Co.
W. J. Kelly, Poel & Kelly.
Paul W. Litchfield, The Goodyear Tire & Rubber Co.
Charles T. Wilson, Charles T. Wilson Co., Inc.
Homer E. Sawyer, ex-officio, United States Rubber Co.

COMMITTEE ON RUBBER AND KINDRED PRODUCTS.

Charles T. Wilson, Charles T. Wilson Co., Inc.
George B. Hodgman, Hodgman Rubber Co.
Homer E. Sawyer, United States Rubber Co.
Bertram G. Work, The B. F. Goodrich Co.
Col. H. Stuart Hotchkiss, United States Rubber Plantations, Inc.
W. J. Kelly, Poel & Kelly.
E. H. Huxley, United States Rubber Export Co., Limited.
E. H. Broadwell, The Fisk Rubber Co.
W. E. Bruyn, L. Littlejohn & Co., Inc.

INDUSTRIAL RELATIONS COMMITTEE.

NEW YORK, FEBRUARY 18, 1920.

To firm and affiliated members:

Referring to our two letters of December 26, respecting the Industrial Relations Committee, particularly our letter asking information respecting industrial relations organizations now functioning in the organizations of all members:

The replies received to our inquiry were very gratifying and indicate clearly to your committee that there is a real opportunity in the industry for cooperative work of this nature and particularly for a medium through which ideas may be exchanged, information given respecting new developments, and assistance offered and supplied wherever required.

The interest in this work indicated by communications received in response to our letter of inquiry prompts your committee to make a further statement of purpose with respect to its work, and to adopt working principles that shall constantly remind the committee and members of the high standard we hope to attain.

As representatives of the rubber industry of the United States and Canada, are we sure, in so far as our relations with our employes are concerned, that our house is in order?

The rubber industry to-day ranks among the largest industries in the country and its place in industrial life is becoming more important each year. Your association wishes to cooperate with you in adopting industrial relations policies that will make the rubber industry the best in the country for all those whose livelihood depends upon it. This large and rapidly growing industry may well bend its efforts toward working out the proper relations between employer and employe with happiness and contentment of worker and management as the outstanding objective. If such a condition is created in our industry it will be a very positive factor in removing causes which result in industrial unrest throughout the whole country and will set a very wholesome example to all other employers.

Let us adopt for our slogan, "THE RUBBER INDUSTRY FOREMOST IN INDUSTRIAL RELATIONS."

The results which we are endeavoring to accomplish can come only through the sincere interest and cooperation of every member of the Rubber Association and it is expected that on such an important matter every member will aid in the work of the Industrial Relations Committee by sending in subjects for discussion, investigation and report.

The maintenance of harmonious and helpful industrial relations ranks in importance with production, distribution, finance and other important functions of management. This is just as true of the small concern as it is of the large one.

Believing in this as a fundamental, your Industrial Relations Committee, desiring to serve your interests, asks you to advise us on the attached return postcard, the name of the official of your organization who supervises or who will supervise this important work, an executive with whom we may correspond on these matters.

A. L. VILES, General Manager.

THE OBITUARY RECORD.

SECRETARY OF AN OLD TRENTON RUBBER COMPANY.

ALFRED WHITEHEAD, secretary and general manager of the Whitehead Brothers Rubber Co., Trenton, New Jersey, died of pneumonia February 3, 1920, at his home, 16 Perdicaris avenue, Trenton, aged 67 years.

ALFRED WHITEHEAD.

Son of the late John and Martha Whitehead, Alfred Whitehead was born in 1853 in the Whitehead farmhouse on Whitehead's Road, where he lived most of his life. His parents died during his childhood and he was brought up by his uncle. Upon completing his elementary education in the country schools, he went to work, at the age of sixteen, in the Whitehead Brothers' rubber factory, then conducted by his uncle and other relatives, but formerly owned by his father. From a minor position he elevated himself to the managership of the plant and was admitted as a member of the firm when the business was incorporated in 1892, later being elected secretary.

He was a director of the Trenton Banking Co., a trustee of the Fourth Presbyterian Church, a member of the advisory board of the Union Industrial Home, and a trustee of the Y. M. C. A. He contributed liberally to charitable institutions and the various war drives held in Trenton. In 1919 he was chairman of the Trenton rubber manufacturers' Salvation Army drive.

In addition to his wife, Pauline W. Whitehead, he is survived by two brothers, Horace and John, and a twin sister, Agnes Whitehead, who is a missionary in India.

Interment was in the family plot in Trenton.

FOUNDER OF THE DIAMOND RUBBER CO.

Although Ohio Columbus Barber is best known as the "Match King" and the chief energies of his very active life were devoted, first to the successful development of his own match factory in Akron, Ohio, and later to the amalgamation of the match business in the United States and the English-speaking world, it was almost inevitable that he should take a deep interest in rubber also, should help develop that industry from almost the beginning of its expansion.

As his name indicates he was an Ohio product, born and reared at East Akron where his father's match factory was situated. He lived there all his life from the year of his birth, 1841, to that of his death, 1920. It was there and in the town he built out of it, Barberton, that he carried on his business and saw develop before his eyes the the amazing growth of the rubber industry in the district around him. He had foresight and shrewdness to take a hand in that and as early as 1893, when the bicycle tire was making its influence felt he induced some

other wealthy men to join with him in starting a company which was named the Diamond Rubber Company, after his Diamond Match Company.

Very soon some Harvard graduates and other Boston young men entered its service and mapped out its work, which became the manufacture of rubber goods of all descriptions. Mr. Barber gave them a free hand, but remained a director of the company to the end, was president for many of the early years and always made his influence felt. That he retained his interest in rubber is shown by his becoming a director of the Alkali Rubber Co., the subsidiary formed in 1904 to reclaim rubber. The Diamond Rubber Co. was amalgamated with The B. F. Goodrich Co. in 1912 and Mr. Barber became a director of the latter company also.

After his ostensible retirement from business about ten years ago, he turned to the development of a 2,500 acre farm in his home town, a model experimental farm for all kinds of crops and plants and for the rearing of high bred stock. This farm which is believed to be worth $4,000,000, will go to the Western Reserve University, Cleveland, Ohio. His fortune is estimated at $10,000,000.

The wife to whom Mr. Barber was married in 1866, Laura L. Brown, died many years ago; three years before his death he married Miss Mary Orr, his private secretary. Mr. Barber was a giant in size, over six feet tall, and a picture of health till he fell a victim to influenza.

ASSISTANT SALES MANAGER MILLER RUBBER CO.

William Quigley Cramp, assistant sales manager of The Miller Rubber Co., Akron, Ohio, died suddenly of neuritis January 23, 1920, at the Akron City Hospital, aged 41 years.

WILLIAM Q. CRAMP.

Mr. Cramp was born in Philadelphia, Pennsylvania, October 9, 1878, and on December 30, 1915, married Frances M. Smith, of Buffalo, New York. He had been with the Miller company for over five years, first as a tire salesman in southern territory. His record in this field was so enviable that he was made branch manager at Atlanta, Georgia, and two years ago went to the Akron factory as assistant sales manager, in which position he became one of the most efficient and popular executives of the company. Held in high regard by his associates, his loss is keenly felt. Funeral services were held at the family residence, 491 North Howard street, January 26, and interment was in a vault at Glendale Cemetery.

Mr. Cramp is survived by his wife, Frances M. Cramp; his parents, Mr. and Mrs. Harry A. Cramp, Philadelphia, Pennsylvania; two sisters, Mrs. Thomas Patten and Miss Elsa Cramp, of Philadelphia, and a brother, Howard S. Cramp, Richmond, Virginia. He was a member of the Buffalo, New York, Commandery, Knights Templars.

SOUTH AFRICA IN 1918 IMPORTED $2,112,718 WORTH OF RUBBER goods, including tires, of which the United Kingdom's share was $1,283,476 and that of the United States was $589,090.

RUBBER TRADE INQUIRIES.

THE inquiries that follow have already been answered; nevertheless they are of interest not only in showing the needs of the trade, but because of the possibility that additional information may be furnished by those who read them. The editor is therefore glad to have those interested communicate with him.

(776.) A manufacturing concern requests information as to where it can purchase lead oleate.

(777.) An inquiry has been received for the addresses of manufacturers of machinery for making dress shields of rubber without the use of cloth.

(778.) A request has been received for the addresses of dealers in benzo-hydro.

(779.) A European manufacturer asks for the address of the manufacturer of the Sarco thermostatic regulator.

(780.) A Canadian concern requests the addresses of manufacturers of or jobbers in ear drums for use in swimming.

(781.) Inquiry is made for the address of the manufacturer of the "E. Z. Walk" and "Slipknot" insoles.

(782.) A subscriber requests the addresses of manufacturers of spreaders for valves for inner tubes.

TRADE OPPORTUNITIES FROM CONSULAR REPORTS.

Addresses may be obtained from the Bureau of Foreign and Domestic Commerce, Washington, D. C., or from the following district or cooperative offices. Requests for each address should be on a separate sheet, and state number.

DISTRICT OFFICES.

New York: 734 Customhouse.
Boston: 1801 Customhouse.
Chicago: 504 Federal Building.
St. Louis: 402 Third National Bank Building.
New Orleans: 1020 Hibernia Bank Building.
San Francisco: 307 Customhouse.
Seattle: 848 Henry Building.

COOPERATIVE OFFICES.

Cleveland: Chamber of Commerce.
Cincinnati: Chamber of Commerce; General Freight Agent, Southern Railway, 96 Ingalls Building.
Los Angeles: Chamber of Commerce.
Philadelphia: Chamber of Commerce.
Portland, Oregon: Chamber of Commerce.
Dayton, Ohio: Dayton Chamber of Commerce.

(31,841.) Importer in Brazil desires to secure agencies for and to purchase caoutchouc direct. Correspondence in French or Portuguese.

(31,843.) A firm in Sweden wishes an agency for the sale of inner tubes for bicycles.

(31,849.) A firm in England desires to purchase dressing combs of vulcanite, chiefly 7, 7½ and 8 inches long. Quote f. o. b. English port or f. o. b. New York.

(31,896.) A firm in Mexico wishes to purchase white canvas rubber-soled tennis shoes. Quotations c. i. f. city of Mexico or f. o. b. shipping point. Cash against documents.

(31,916.) A firm in Mexico desires to purchase tires. Quote f. o. b. shipping point.

(31,928.) A firm in Spain wishes an agency on commission for the sale of rubber overshoes and rubber goods. Quote c. i. f. Spanish port. Correspondence in Spanish.

(31,939.) A merchant in Spain wishes to secure an agency to sell rubber raincoats on commission. Quote c. i. f. Spanish port. Correspondence in Spanish.

(31,943.) A firm in Norway wishes to purchase automobile accessories, rubber, and rubber goods. Quote c. i. f. Norwegian port. Payment through banks in Norway and New York.

(31,954.) Agency desired by a firm in Holland for the sale of motorcycle and bicycle tires and tubes. Quote f. o. b. New York. Cash against documents.

(31,965.) A firm in Norway desires agency for sale of rubber, rubber goods, and kindred lines. Quote c. i. f. Norwegian port. Payment through banks in Norway or New York.

(31,995.) A firm in Brazil wishes to represent manufacturers of rubber tubes and tires.

(32,016.) Importer in Belgium wishes an agency for bicycles and tires. Payment two-thirds cash with order, balance upon receipt of goods. Correspondence and catalogs in French.

(32,042.) Commercial agent from Bulgaria wishes to secure an agency for belting and rubber shoes.

(32,044.) A merchant in India desires to secure an agency for motor accessories, tubes and tires. Quote f. o. b. Bombay. Payment through bank in Bombay.

(32,050.) A man in France wishes an agency for the sale of motor tires and tubes and all articles for automobile and pneumatic trade. Quotations c. i. f. Bordeaux. Correspondence may be in English.

(32,059.) Agent in South Africa wishes to secure agency for rubber soles and heels; either one or two-piece.

NEW TRADE PUBLICATIONS.

THE HOOVEN, OWENS, RENTSCHLER CO. OF HAMILTON, OHIO, which for nearly forty years has been installing its Hamilton Corliss engines in power plants throughout the country, has issued a striking folder describing its sugar mill machinery.

THE APSLEY RUBBER CO., HUDSON, MASSACHUSETTS, IS MAILING to the trade a handsome 80-page catalog of its extensive lines of rubber footwear for the year 1920. Rubbers, arctics, and rubber boots and shoes of many styles are shown, including first- and second-grade brands, an extra quality brand, and the special wear-resisting "Rock-Hill" line.

T. W. MORRIS, 3304 WARREN AVENUE, CHICAGO, ILLINOIS, HAS published a well illustrated 26-page brochure describing and containing operating instructions for his automatic trimming machines for heels, soles, mechanical goods, plumbers' supplies, etc., also his water bottle and fountain syringe machine and patent cutters. These trimmers have already been described in THE INDIA RUBBER WORLD.

"FACTS ABOUT PNEUMATIC TRUCK TIRES" IS A LARGE AND interestingly illustrated brochure of 48 pages, issued by the United States Tire Co., New York City, to tell by word and picture about the use of nobby cord tires throughout the country for a great variety of purposes and under the most trying conditions. Much useful information is presented and the practicability of pneumatic tires for heavy commercial vehicles is amply shown.

"THINGS THAT INTEREST FIRESTONE SHAREHOLDERS" IS THE title of a handsome 16-page brochure, bound in boards, which outlines the rubber situation and the tire demand in America and presents the outstanding features of the accomplishments, future plans, plant enlargements, and organization of the Firestone Tire & Rubber Co.

THE EAGLE RUBBER CO., ASHLAND, OHIO, MANUFACTURERS OF toy balloons and novelties, has issued a new catalog, illustrating and describing its complete line of toy balloons. This is an especially attractive catalog with an appropriate cover design.

THE GOODYEAR TIRE & RUBBER CO., AKRON, OHIO, HAS PUBlished an attractive 84-page booklet telling the history of the industrial representation plan which was inaugurated in its factory in April, 1919, and is said to be functioning successfully. The plan or constitution of the Council of Industrial Relations, as it is called, is given in full, indicating that the assembly is based on the plan of the United States Government, with a Senate and House of Representatives as legislative bodies, the factory manager holding the executive position corresponding to the President.

Following an account of the election of factory representatives with specimen posters, ballots and the actual result of the polling, there is a section devoted to the assembly as now constituted with portraits and biographical sketches of all men holding office. It is a booklet that will be read with interest by all students of industrial relations.

"AUTOMOBILE RACING SEASON, 1919," IS THE TITLE OF A HANDsome 48-page, profusely illustrated booklet dedicated to the drivers of racing cars, who have contributed the valuable lessons of the speedways to the advancement of automobile and tire development. Published by The Goodyear Tire & Rubber Co., Akron, Ohio, and intended primarily to show the popularity of Goodyear cord tires among the racing fraternity, it also contains much general information of interest regarding the development of automobile racing, its place in automobile development, racing tires, how races are timed, the pit and tire service rendered to each car, and the principal racing records of the season.

THE EDITOR'S BOOK TABLE.

"CEYLON RUBBER PLANTER'S MANUAL." By R. Garnier. The Times of Ceylon Co., Limited, Colombo, Ceylon. (Small quarto, 7¾ by 6¼ inches, 206 +15.8 pages, illustrated.)

A THOROUGHLY TECHNICAL AND PRACTICAL HAND-BOOK designed for planters in Ceylon, but, with certain modifications, useful to planters in Southern India and Malaya, wherever the conditions of climate and soil are similar. The author begins by clearing the ground for rubber cultivation; he then examines the soil, fertilizes it, plants the trees, and nurses them to tapping age. He describes the methods of tapping and the diseases to which plants are subject, then turns to "manufacturing" and the factory. These are the local terms for preparing the rubber for market, and for the buildings where the smoking and packing of the crude rubber are done.

The latter half of the book is taken up with provisions for the coolie labor employed, the housing, sanitation, medical care of the laborers, and with architectural plans for the many buildings required. At the end are interesting and instructive statistical tables of the yearly cost of running a large plantation, with detailed lists of expenditures. It teaches the Ceylon planter all that a book can tell him, and will be helpful to planters in neighboring lands.

"THE FINANCIER RUBBER SHARE HAND BOOK," SIXTEENTH edition, December, 1919. The Financier and Bullionist, Limited, London. (Cloth, octavo, 954 pages.)

This useful and convenient annual contains detailed information regarding the British stock companies that own rubber plantations in any part of the world and whose shares are dealt with in the London rubber market. Compact data will be found regarding capital, officers, business addresses, financial status, dividends, the acreage of the plantations, the crops, yield prices and so forth. In the introduction E. L. Killick, the rubber expert of the Financier, gives his views about the immediate future of rubber production.

"HENDRICKS' COMMERCIAL REGISTER OF THE UNITED STATES for Buyers and Sellers." S. E. Hendricks & Co., New York City. (2703 pages.)

The 28th annual edition of this work deals as usual with both raw materials and finished products of all industries, electrical, engineering, chemical, steel and so forth, including rubber. A new method of exterior indexing by coloring has been added. A "trades index" of 162 pages, with cross references, is followed by a classified trades list of 1813 pages, containing over 18,000 different products. After this come the names and addresses of manufacturers, 216 pages, an alphabetical index of 487 pages and an index of advertisers. It has been brought up to date in every respect and is an invaluable work for sales and purchasing departments in all business houses.

Index to "Rubber Machinery" will be sent free upon request.

CONDAMINE, THE POPULARIST OF INDIA RUBBER.

HOW INDIA RUBBER was made known to Europe by Charles Marie de La Condamine, of the Academy of Sciences, and later of the French Academy is told very entertainingly by André Dubosc in his *"Histoire du Caoutchouc."* La Condamine was a typical product of the eighteenth century; a thorough Parisian, born of a commercial family that had been ennobled because it was in the Government employ. He left school at seventeen to enlist in the army, where he distinguished himself by foolhardy valor, but when peace came he threw up his commission and became a literary man about town. He showed the hereditary business sense and ability to push his way socially; he frequented the salons of literary ladies, could work off clever verse, and was interested in all scientific novelties. He dabbled in chemistry, in mathematics and in astronomy; he was a friend of Voltaire, and of most of the prominent literary Frenchmen of his time, He lived this life of fashion until he was thirty-four, and indulged in an adventurous journey to the Orient, spending a year in Constantinople.

("Histoire du Caoutchouc.")

CHARLES DE LA CONDAMINE.
(1701-1775.)

A scientific quarrel as to whether the earth was flat or projected at the poles, resulted in two French expeditions setting out to measure the degrees of longitude, one to Lapland, the other to some place near the equator. La Condamine joined the latter expedition, which picked out Ecuador, then a portion of Peru, as the scene of its activity. The men in charge kept quarrelling, and La Condamine left the others at Playa del Oro to make his way to Quito alone. He had a hard time on his journey along the Andes and reached his destination a month after the rest of the expedition; but he was a good botanist and he kept his eyes open, and on reaching Quito the first thing he did was to send to the Academy of Sciences "some rolls of a blackish, resinous material" which he had gathered in the forests; namely, caoutchouc. This was in 1736. The expedition stayed on for several years measuring the meridian, constantly quarrelling among themselves and being interfered with by the Spanish Viceroy.

La Condamine in writing home explained that this liquid flowed out of a tree, *Hevé*, after a single incision, milk-white and gradually hardening and blackening in the air. The natives made torches of it; they spread the liquid on cloth and used it as we use waxed cloth. Along the Amazon the Indians made boots of it which kept out the water; they put it around molds shaped like bottles, and when the gum had hardened they broke the mold, producing a light, unbreakable bottle that would hold any liquid. He set to work himself and made waterproof cloths, and also a splendid rubber case for his quadrant. He noted too, that the natives made small bottles of the rubber which they filled with hot water and used as syringes; they in consequence, called the tree, *seringueira*.

By September, 1742, after he had made important discoveries in physics and mathematics, he decided that his work was done and that he would make his way down the Amazon to the French settlement at Cayenne, a journey of 2,000 miles in nearly unexplored regions. He made the journey alone, with only native attendants and reached Guiana in May, 1743. On his trip he had plenty of opportunities of examining the manner in which the rubber grew and the natives utilized the rubber. As France was at war with England he was obliged to wait two years at Cayenne before returning home, but he reached La Rochelle at last on March 7, 1745. He returned to his literary pursuits and told in the salons the story of his adventures and the wonderful qualities of the rubber which he had found, specimens of which he exhibited. Paris of the eighteenth century, however, did not take the discovery any more seriously than it did the beginnings of modern science, and it was reserved to Hancock and Goodyear in the following century to break the way for the modern uses of rubber.

In the five years following his return La Condamine wrote six big volumes, and, despite his social activities and his literary quarrels, kept up his interest in rubber. His friend Fresneau found the rubber tree in Guiana and wrote to him the description of the native method of gathering it, smoking it and using it. He and the French chemists who examined the new substance reached conclusions that are startlingly similar in many points to those reached by modern rubber chemists. Fresneau, for instance, thought it was a kind of condensed resinous oil; the name now used is polyterpene. To prevent it from sticking he used Spanish white, ashes or dust.

La Condamine induced other explorers to search for rubber and learned before he died in 1775 that it had been found in the Isle de France and in Madagascar. Nevertheless, the only practical commercial use found for the caoutchouc in that century was as an eraser of pencil marks, which led to Priestley's christening it by the name it has retained in English, "india rubber."

NEW INCORPORATIONS.

Accurate Cover Co., Inc., February 5, 1920 (New York), $50,000. R. M. and D. Coen, G. C. Woolf—all of 373 Canal street, New York City. To deal in rubberized fabrics, etc.

Associated Tire Corp., The, December 15, 1919 (Massachusetts), $60,000. H. L. Michaels, H. C. Cashman, W. Hartstone—all of 40 Court street, Boston, Massachussetts. Principal office, Boston, Massachusetts. To buy, sell, exchange, repair and dispose of rubber, fabric, cord tires and inner tubes.

Bell Tyre & Rubber Co., Inc., January 28, 1920 (Virginia), $50,000. R. J. Bell, president; A. R. Hall, vice-president; H. W. Powers, secretary; T. Bell, treasurer. Principal office, Richmond, Virginia. To deal in automobile acessories.

Bliss Rubber Co., The, November 21, 1919 (Massachusetts), $5,000. J. E. Crowley, 86 Dean road, Brookline; P. C. Adams, 514 Liberty street, South Braintree—both in Massachusetts; A. Bliss, 130 Empire street, Providence, Rhode Island. Principal office, Boston, Massachusetts. To manufacture and deal in tires, tire rims, woven hose and rubber hose.

Boston Sanitary Belt Co., December 16, 1919 (Massachusetts), $50,000. J. W. Barlow, 80 Tyler street, Wollaston; E. M. Sanger, 120 Glenville avenue, Boston; A. C. Gould, 1704 Beacon street, Waban—all in Massachusetts. To manufacture elastic and non-elastic sanitary belts and other sanitary articles.

Central Tire Co., December 2, 1919 (Massachusetts), $25,000. N. T. Balch, 35 Lincoln street, Gardner; R. L. Chandler, 219 Washington street; B. W. Jenkins, 35 Lancaster street—both of Leominster—all in Massachusetts. Principal office, Leominster, Massachusetts. To sell automobile tires, accessories and supplies.

Century Rubber Stamp Works, Inc., January 28, 1920 (New York), $24,000. W. C. Campbell, 410 Fifth avenue; C. Trebing, 900 Hart street, both of Brooklyn; H. Heine, 286 St. Ann's avenue, Bronx—all in New

York. Principal office, 551 Pearl street, New York City. To manufacture rubber stamps, etc.

Cleveland Amalgamated Tire Stores Corp., February 9, 1920 (New York), $20,000. S. and A. Newman, G. J. Bates—all of 1974 Broadway, New York City. To deal in tires, etc.

Crude Rubber Brokerage Co., Inc., January 31, 1920 (New York), $10,000. M. Frankfurter, president; N. Diamond, secretary and treasurer. Principal office, 198 Broadway, New York City. To buy and sell rubber on commission.

Dalff Tire Co., Inc., February 16, 1920 (New York), $50,000. G. Gaschott, 136 Junction avenue, Corona; J. H. Jackson, Scarsdale; M. M. Coughlin, 233 West 121st street, New York City—all in New York. To manufacture tires.

Dawson Tire & Supply Co., January 14, 1920 (New Jersey), $75,000. Albert J. and James J. McGuire, both of 315 Parker street; S. Goldrosen, 24 Farley avenue—all in Newark, New Jersey. Agent in charge, A. J. McGuire. To manufacture, buy, sell and deal in tires and automobile accessories.

Esch Manufacturing Corp., December 10, 1919 (New York), $250,000. H. S. Esch, T. F. Fay, W. G. Wahaley—all of 27 William street, New York City. To make treads for automobiles.

Fond du Lac Oil & Rubber Corp., January 2, 1920 (Wisconsin), $25,000. D. E. Russell, J. R. Matthews, R. W. Slater. Principal office, Fond du Lac, Wisconsin. To manufacture, buy, sell and deal in rubber tires, tubes, rubber specialities, etc.

Gammeter Co., W. F., The, December 26, 1919 (Ohio), $100,000. W. F. Gammeter, president; L. B. Gammeter, vice-president; F. O. Gammeter, secretary and treasurer; J. M. Gammeter, assistant secretary and production manager; B. I. Gammeter, director. Principal office, Cadiz, Ohio. To manufacture Universal steel calender stock shells, belting shells, tire machine drums, and steel specialties.

Globe Shoe Heel Corp., February 13, 1920 (New York), $6,000. E. Roth, 230 New Main street; S. Roth, 55 Hawthorne avenue; M. Roth, 6 Madison avenue—all of Yonkers, New York. Principal office, Yonkers, New York. To deal in rubber and leather goods.

Hanes Rubber Co. of New York, January 15, 1920 (New York), $10,000. E. O. Machlin, W. T. H. Reilly, R. L. Delisser—all of 135 West 79th street, New York City. To deal in pneumatic tires.

Highland Tire & Rubber Co., November 24, 1919 (Delaware), $200,000. P. F. Reilly, H. D. McCutcheon, J. A. McCullough—all of Pittsburgh, Pennsylvania. To manufacture and sell tires, etc.

Hood Rubber Products Co., Inc., December 29, 1919 (Massachusetts), $1,500,000. F. C. Hood, E. I. Aldrich, both of Brookline; J. D. Colt, C. H. Dwinnell, both of Newton; A. D. Bosson, Boston; H. Gage, Worcester; H. E. Warner, Lincoln—all in Massachusetts. Principal office, Watertown, Massachusetts. To buy, sell and deal in footwear, clothing, tires, tubes and rims.

International I. T. S., December 9, 1919 (Delaware), $1,200,000. T. L. Croteau, P. B. Drew, H. E. Knox—all of Wilmington, Delaware. To manufacture rubber products, including heels.

J. W. P. Tire Co., The, July 19, 1919 (Ohio), $5,000. G. L. Webber, president; F. E. Simon, vice-president; W. E. Bennett, secretary and treasurer; F. M. Jessup, general superintendent; R. Sigler, works manager. Principal office, 952 Valley street, Dayton, Ohio. To manufacture tires.

McClaren Rubber Tire Co. of New York, Inc., February 17, 1920 (New York), $28,000. W. F. Smith, 644 Riverside Drive; C. E. Lynch, 720 Lexington avenue; A. F. Lynch, 56 East 59th street—all of New York City. To deal in tires.

Manhattan Insulated Wire & Cable Corp., February 20, 1920 (New York), $50,000. S. A. Morrissey, 30 Church street; C. Kurzon, 155 East Houston street, both of New York City; R. H. Cherry, Westfield, New Jersey. To manufacture insulated wire, cable, hose, etc.

Mustor Manufacturing Co., Inc., February 13, 1920 (New York), $50,000. G. F. Mustor, 25 Hubbard place, Brooklyn; A. E. Barnes, 2120 Jerome avenue, Bronx; J. W. Mitchell, 1733 Grand Central Terminal, New York City—all in New York. To manufacture rubber and asbestos goods.

Ohio Valley Tire & Rubber Co., The, January 2, 1920 (Ohio), $50,000. A. Stollmaier, president; R. C. Smith, vice-president; J. M. Ferguson, secretary and treasurer; A. Bernstein, general manager; J. Sagmeister, director. Principal office, southeast corner Eighth and Race streets, Cincinnati, Ohio. To distribute various makes of tires and deal in all standard makes.

Otto Tire & Rubber Co., December 13, 1919 (Indiana), $100,000. H. J. Otto, president; G. F. Ahlering, vice-president; A. J. Hoffman, secretary; G. H. Bippus, treasurer; C. E. Hughes, director. Principal office, 208-210 Upper Fifth street, Evansville, Indiana. To distribute Perfection tires, repair and rebuild tires and tubes.

Prudential Rubber & Airless Tire Corp., February 16, 1920 (New York), $25,000. H. Hennig, J. Parrino, J. Di Girolamo—all of Buffalo, New York. Principal office, Buffalo, New York. To manufacture rubber goods, tubes, etc.

Rambler Rubber Corp., December 28, 1919 (Delaware), $50,000. N. N. Kenney, M. Butler, M. M. Lucey—all of Wilmington, Delaware. To deal in automobile tires.

Road Gripper Tire & Rubber Co., November 26, 1919 (Minnesota), $150,000. F. and M. C. Trahms, T. W. and I. M. Bolzendahl—all of Minneapolis, Minnesota. Principal office, St. Paul, Minnesota. To manufacture leather and rubber goods.

Simplicity Valve Co., December 18, 1919 (Massachusetts), $200,000. C. J. Reynolds, 30 Summer street, Melrose; S. L. Reade, 4 Arrow street, Cambridge; C. E. Conant, 140 Mt. Vernon street, Newtonville—all in Massachusetts. Principal office, Boston, Massachusetts. To manufacture and deal in automobile and pneumatic tire equipment of every description.

Stanley Tire & Rubber Corp. of Delaware, December 17, 1919 (Delaware), $250,000. S. B. Howard, G. V. Reilly, R. K. Thistle—all of New York.

Stockwell Rubber Co., Inc., August 20, 1919 (Pennsylvania), $25,000. F. E. Stockwell, president; A. J. Vollrath, vice-president; W. P. Sibley, secretary and treasurer. Principal office, 229 North 12th street, Philadelphia, Pennsylvania. Wholesale distribution.

Traveler Tire Co. of Pittsburgh, January 14, 1920 (Delaware), $100,000. S. D. Townsend, Jr., V. Barsky, G. H. Reed—all of Wilmington, Delaware.

Universal Rubber Products Co., May 26, 1919 (Delaware), $2,000,000. T. L. Croteau, P. B. Drew, C. L. Rimlinger—all of Wilmington, Delaware. Delaware agent, Corporation Trust Co. of America, Du Pont Building, Wilmington, Delaware. To manufacture hose, belting, straps, tubes, tires and rubber goods.

Vulcan Rubber Co. of New Jersey, December 11, 1919 (New Jersey), $100,000. E. R. Crow, W. N. Goodrich, both of East Orange; W. E. Dunkinson, Newark—both in New Jersey. Principal office, 232 Halsey street, Newark, New Jersey. Agent in charge, W. E. Dunkinson. To make, purchase, sell and deal in tires and tubes.

Young Rubber Products Co., January 12, 1920 (Delaware), $600,000. To manufacture "Ev-R-Wear" electric rubber patch, etc.

INTERESTING LETTERS FROM OUR READERS.

QUESTIONS OF INTEREST.

To THE EDITOR:

DEAR SIR:—As a big holder of rubber growing companies' shares, I follow with interest the rubber trade and have posted to me each month your paper (THE INDIA RUBBER WORLD) by the International News Agency.

I should esteem it a great favor if you would kindly give me a reply to this letter, and at the same time tell me how I can repay you.

It has recently been stated in the press that the stocks of rubber in America exceed 50,000 tons. Is this correct, do you think?

Further, the English papers estimate that America will take (U. S. A. alone) 360,000 tons of rubber this year, roughly, 50 per cent more than last year. Do you consider this probable?

As a close follower of the market I am convinced that if your demands exceed 240,000 tons the stocks will be reduced so low that by December, 1920, rubber will reach at least 3*s.* 6*d.* to 4*s.* a pound.

Could you state also the number of motor cars registered in the U. S. A. December 31, 1919, including, of course, motor trucks and wagons? Also the number of cars and wagons made during 1919 and the number estimated to be built during 1920.

It would be interesting to know whether you consider that a shortage of rubber is likely in the autumn of this year or early next year.

ENGLISHMAN.

FINANCES REQUIRED FOR BALATA EXPLOITATIONS.

To THE EDITOR:

DEAR SIR:—On my arrival here last month, I saw your balata article in your June issue, having just returned from the Rio Branco district via Manáos, Brazil, after exploring and starting a balata industry. This industry is now well started under the name of Norzagaray & Boyd.

I was the pioneer official (local secretary of the directorate formed in Georgetown, British Guiana) from London sent out by the Consolidated Rubber & Balata Estates, Limited, and left after two years. The C. R. B. E., Limited, took over the grants and balata businesses of Garnetts, Davsons, Downer, McKinnon, Dr. Bovallius and north territories from a "Colonel" Link.

I intend returning to Manáos to do explorations for fibers chiefly, and incidentally balata, if I have capital at my disposal. If there are any live manufacturers in your country who want to carry out explorations and secure balata areas, please let them communicate with me. Agreements must be made and treated according to English laws. The areas just explored are now being transferred to an English combine. I know where there are other reefs, etc. No use opening bank credits in Manáos for the produce. If a large prospecting company is formed, I will take charge of the expedition and the financiers can send their own representative to manage the cash, accounts and correspondence.

In 1918 for end of season, and owing to shortage of bleeders, Norzagaray & Boyd shipped about 16 tons, and during 1919 season it will be between 35 and 40 tons. Bleeders had to be imported and trained. The Peruvians turn out very capable and reliable.

WILLIAM A. BOYD.

15 Seething Lane, London, E. C. 3.

News of the American Rubber Trade.

DIVIDENDS.

THE AMAZON RUBBER CO., Akron, Ohio, has declared its semi-annual dividend of three and one-half per cent on preferred stock.

The American Chicle Co., New York City, has declared its quarterly dividend of one and one-half per cent, payable April 1 on stock of record March 20, 1920.

The International India Rubber Corp., South Bend, Indiana, has declared the regular annual dividend of seven per cent in cash on the preferred stock for the year 1919 and has also directed a cash distribution out of earnings equal to six per cent on common stock. In addition, the directors have authorized the payment in cash of the entire accumulated dividends on outstanding preferred stocks for the years 1917 and 1918.

The Plymouth Rubber Co., Canton, Massachusetts, has declared its quarterly dividend of one and three quarters per cent, payable March 1 on preferred stock of record February 24, 1920.

The van der Linde Rubber Co., Limited, Toronto, Ontario, has declared its regular semi-annual dividend at seven per cent, payable to shareholders of record January 1, 1920.

The Tyer Rubber Co., Andover, Massachusetts, declared and paid on February 14, 1920, its quarterly dividend of $1.50 per share on preferred stock.

FINANCIAL NOTES.

While the detailed statement of the operations of the United States Rubber Co. for the year 1919 is not yet completed, it is announced that the volume of sales and the net earnings for the past year are the largest in the history of the company. The surplus earnings for the year 1919 will doubtless be ample to cover all dividends paid during the year, including the cash dividends and the common stock dividend of $9,000,000 declared January 8.

At the close of the year the company had no outstanding notes or obligations other than current accounts and acceptances necessary in the conduct of its business. The cash in bank was over $15,000,000 and $2,800,000 of Liberty Bonds were in its treasury.

It is estimated that the very substantial enlargement of the company's tire plants at Detroit, Michigan; Indianapolis, Indiana; Hartford, Connecticut; Providence, Rhode Island, and Kitchener, Ontario, Canada, now in progress will, when completed, more than double the present tire production.

The Portage Rubber Co., Akron and Barberton, Ohio, has offered 5000 shares each of its preferred and ordinary stock to its stockholders at par. Each stockholder could subscribe up to 20 per cent of his holdings, but was obliged to take equal amounts of common and preferred. The option terminated on January 10, 1920.

Sales of The Mason Tire & Rubber Co., Kent, Ohio, for the quarter ended January 31, 1920, amounted to $1,313,927.35, an increase of over 100 per cent over the figures for the same quarter of last year, which were $630,930.16. The Mason factory expects to show more than 100 per cent gain in business for the year. The net profits for the quarter show a handsome increase over those for the same period last year.

The Gillette Rubber Co., Eau Claire, Wisconsin, has issued $750,000, 7 per cent cumulative preferred stock, par value $100. The new capital will provide for expanding both the tire and the raincoat and waterproofing departments. The company began operations in March, 1917, turning out 100 tires a day; its present production is 1000 tires and, when the additions to the plant are completed, will be over 1500 tires a day.

The sales of the B. F. Goodrich Company in 1919 amounted to $142,000,000 and at the present rate will be $200,000,000 for 1920. The common stock paid 6 per cent and the year's earnings show that 24 per cent was earned on it.

A special meeting of the stockholders will be called for March 10, 1920, to consider a plan for financing which will be presented in detail. As part of the plan the directors propose to change the common stock to non-par value shares, in harmony with the action of many of the largest industrial institutions at this time. The stockholders will be asked to increase the number of shares of authorized common stock so as to provide, among other things, for the conversion of the proposed notes. In addition, the directors deemed it advisable to have shares of the new common stock available for purchase by the employes of the company, so that they may participate in the company's prosperity. If the stockholders take the necessary action to authorize the proposed convertible notes, opportunity will be given them, in due course, to subscribe thereto upon favorable terms. The issue has been underwritten by a group of New York bankers.

E. F. Jones, of Elyria, Ohio, formerly identified with the steel industry, has been elected president of The Republic Rubber Corp. to succeed Guy E. Norwood, who has resigned.

At a meeting held February 20, the stockholders voted favorably on the resolution of the directors advising amending the articles of incorporation so as to increase the number of shares of common stock without normal or par value from 650,000 to 1,500,000 shares, and also so as to increase the amount of working capital from $15,750,000 to $20,000,000.

The recommendation of the directors was adopted by the following vote, the respective vote of each class of stock exceeding 60 per cent of such stock; first preferred stock, 42,376 shares, second preferred stock, 15,819 shares and common stock, 269,787 shares. Total 327,982 shares affirmative, none in the negative.

FINANCIAL STATEMENT OF THE CONVERSE RUBBER SHOE CO.

The Converse Rubber Shoe Co., Malden, Massachusetts, has recently issued its annual balance sheet for the year ended December 31, 1919, which shows the following figures adjusted to the sale of a $500,000 preferred stock issue now in the market:

CURRENT ASSETS.		
Cash	$208,102.10	
Accounts receivable	1,261,754.58	
Notes receivable	126,618.31	
Liberty bonds	349,958.06	
Raw material	672,003.51	
Finished goods	1,634,891.00	$4,253,327.56
Investments	$ 37,436.21	
Other accounts receivable	12,995.01	
Plant and equipment	912,929.66	
Auto trucks	15,773.52	
Leases, trademarks, copyrights	255,000.00	
C.R.S. Co. general capital stock	38,300.00	
C.R.S. Co. preferred stock	4,100.00	
Prepaid expense	146,915.89	$1,423,450.29
		$5,676,777.85
CURRENT LIABILITIES.		
Notes payable	$1,456,200.00	
One year coupon notes	500,000.00	
Accounts payable	168,144.91	
Dividend reserve	13,845.12	$2,138,190.03
Preferred stock	2,125,000.00	
General capital stock	375,000.00	
Three year gold coupon notes	285,000.00	
New York reserve	3,819.53	
Tire adjustment reserve	264.27	
Reserve	148,120.49	
Surplus	601,383.53	$3,538,587.82
		$5,676,777.85

The Converse Rubber Shoe Co., Malden, is offering to the

public a $500,000 issue of seven per cent cumulative preferred stock, the par value of the shares being $100. The proceeds of this issue will be used to reduce floating debt and to finance the greatly increased volume, the company's sales having jumped from $977,180 in 1913 to $4,923,296 in 1918, and an estimated total of $5,500,000 for the fiscal year ending April 1, 1920. For the past four years the demand for the company's products has greatly exceeded the supply, and during the past two years alone orders aggregating $2,000,000 were refused.

THE GOODYEAR TIRE & RUBBER CO. STATEMENT.

According to the annual report of The Goodyear Tire & Rubber Co. for the fiscal year ended October 31, 1919, the last year's business has been the largest and most profitable in the history of the organization. Sales were $168,914,982, against $131,247,382 for the preceding year; net profits (subject to Federal tax) were $23,277,245, against $15,388,190 for the preceding year. During the year dividends were paid on the capital stock as follows: first preferred, 7 per cent, $1,664,866; second preferred, 8 per cent, $1,149,074; common, 12 per cent, $2,489,355. In accordance with the articles of incorporation, as amended, capital stock was redeemed during the year as follows: first preferred par value of $609,900 and second preferred $1,318,400. There remains an unappropriated surplus of $33,332,666, subject to Federal taxes for the year.

During the year the authorized preferred and common stock of the company was increased to $100,000,000 each. Of the new preferred stock offered to stockholders and employes, $41,135,900 has been subscribed by 30,409 persons throughout the country, of which amount $7,843,600 was subscribed by 17,407 employes of the company.

The balance sheet as of October 31, 1919, follows:

ASSETS.

Plant, as per books:		
Real estate and buildings	$17,752,994.19	
Machinery and fixtures	17,507,512.49	
		$35,260,506.68
Patents, trade-marks, designs		1.00
Securities owned—other than U. S. Liberty Bonds—book values		4,440,602.69
First preferred stock, purchased and held in treasury, 3,592 shares, par value $359,200		326,993.19
Notes receivable of officers and employes for capital stock, secured by such stock to the par value of $1,621,900		1,324,741.07
Employes' subscriptions for 2nd preferred stock (balance unpaid)		48,661.68
Inventory and current assets:		
Inventory	$35,566,779.06	
Accounts and notes receivable (provision in reserve for doubtful items $231,445.30—see contra)	23,635,353.98	
Advances to agents, salesmen and companies	3,648,895.19	
United States Liberty Bonds, $3,405,800.00		
Less notes payable, secured by same 1,120,000.00	2,285,800.00	
Cash on deposit and on hand	10,395,241.32	
		75,532,069.55
Advances to the Goodyear Improvement Co. and to The Goodyear Heights Realty Co.		1,880,328.06
Suspended assets (provision in reserve for doubtful items, $182,076.36—see contra)		182,076.36
Prepaid rentals, interest, insurance, etc.		1,280,851.42
		$120,276,831.70

CAPITAL AND LIABILITIES.

Capital stock (par value $100 per share):		
First preferred (7 per cent cumulative)—Authorized and issued $25,000,000.00		
Less—redeemed 1,826,100.00	$23,173,900.00	
Second preferred (8 per cent cumulative):		
Authorized $25,000,000, issued 14,468,700.00		
Reserved for issue to employes on partial payment subscriptions 347,100.00		
14,815,800.00		
Less redeemed 1,318,400.00		
	13,497,400.00	
Common authorized, $50,000,000 issued	20,757,600.00	
		$57,428,900.00
Current liabilities:		
Purchase accounts and acceptances payable	7,722,740.24	
Sundry other accounts payable	2,766,021.69	
Notes payable	9,500,000.00	
Accrued first preferred dividends	138,738.84	
Second preferred dividends payable November 1, 1919	289,200.66	
Federal income and excess profits taxes to October 31, 1918, balance unpaid	1,368,782.17	
		21,785,483.60
Reserves:		
For doubtful accounts (current)—see contra	231,445.30	
For doubtful accounts (suspended assets)—see contra	182,076.36	
For insurance on branch stocks	103,335.82	
For industrial compensation	38,470.10	
For pensions	100,000.00	
For depreciation of plant	7,074,454.11	
		7,729,781.69
Surplus, subject to federal taxes for the year		33,332,666.41
		$120,276,831.70

Subject to contingent liability for notes receivable discounted, amounting to $8,604,414.82.

STATEMENT OF THE WELLMAN-SEAVER-MORGAN CO.

The Wellman-Seaver-Morgan Co. has reduced borrowed capital from $1,200,000 to $425,000 and regularly paid quarterly dividends, besides the deferred dividends on the preferred stock for the years 1917 and 1918. The original issue of preferred stock has been redeemed and cancelled, and there is but one class of preferred stock outstanding. The working capital is ample for anticipated requirements. The condensed balance sheet as of December 31, 1919, follows:

ASSETS.

Current:	
Cash	$305,978.14
United States Liberty Bonds	188,541.70
Notes receivable	1,187,807.24
Accounts receivable	942,021.92
Inventory	529,953.40
Uncompleted contracts	1,529,327.24
Other assets	74,746.20
Permanent—land, buildings and machinery	3,143,317.23
Patents	264,512.79
Deferred	31,708.85
	$8,197,914.71

LIABILITIES.

Current:	
Notes payable	$425,000.00
Accounts payable	712,955.44
Dividends payable January 2, 1920	81,850.00
Accrued	37,718.50
Advances on contracts	453,554.62
Reserves	274,722.29
Capital stock—preferred	2,500,000.00
Capital stock—common	2,540,000.00
Surplus	1,172,113.86
	$8,197,914.71

HOOD RUBBER PRODUCTS CO., INC.

The Hood Rubber Co., Watertown, Massachusetts, which has formerly sold its products, both footwear and tires, direct to manufacturers, dealers and jobbers and through subsidiary selling companies, has organized a new corporation, the Hood Rubber Products Co., Inc., under the laws of Massachusetts, with a capital of $1,000,000 preferred and $500,000 common stock, to take over the sale and distribution of its products. To the new company will be transferred all the business and assets of the former subsidiaries, namely: Hood Tire Co., Inc., Watertown, Massachusetts; Pilgrim Rubber Footwear Co., Boston, Massachusetts; Pioneer Rubber Shoe Co., Minneapolis, Minnesota; Dearborn Rubber Co., Chicago, Illinois; Iowa Rubber Shoe Co., Davenport, Iowa; Southwest Rubber Footwear Co., Kansas City, Missouri; Capital City Rubber Co., Columbus, Ohio; Grand Rapids Shoe & Rubber Co., Grand Rapids, Michigan.

The Hood Rubber Co. retains all the common stock of the new company, and until February 3, 1920, offered the preferred stock first to its own stockholders. The directors of the Hood Rubber Products Co. Inc., include the directors of the Hood Rubber Co. and the officers are: president, Frederic C. Hood; vice-president, Francis S. Dane and Edward I. Aldrich; treasurer, Erle A. Bishop; assistant treasurers, Francis S. Dane and Thomas H. Burton; general manager, William W. Duncan. The sales for 1918 and 1919 amounted to $25,000,000 each year and a substantial increase on this sum is expected in 1920.

PERSONAL MENTION.

W. H. Hurley has been promoted from the position of western district manager to that of eastern district manager of The McGraw Tire & Rubber Co., Cleveland and East Palestine, Ohio, with headquarters in New York City.

John D. Olwell has been elected president of the Akron Overland Tire Co., Inc., formerly the Akron Tire Co., Inc., Long Island City, New York.

H. W. Harwell has been placed in charge of the New York general sales office of the Henderson Tire & Rubber Co., Inc., Columbus, Ohio, with headquarters at 40 Exchange Place, New York City.

William B. Clowar, for several years superintendent of the hose department of the New York Rubber Co. at Beacon, New York, recently resigned that position to become superintendent of the Auto Topping Department of the Vulcan Proofing Co., Dean street plant, Brooklyn, New York.

Casper Smith, president of the Smith Chemical & Color Co., Inc., 116 Nassau street, New York City, has just returned from a two months' business trip throughout the United States. He reports business brisk, particularly in the West and Middle West.

Clarence F. Brown has been appointed director of advertising of E. I. du Pont de Nemours & Co., Inc., Wilmington, Delaware, succeeding George Frank Lord, resigned.

The following promotions are announced by the Westinghouse Electric & Manufacturing Co., East Pittsburgh, Pennsylvania: Alexander Taylor from manager of works to assistant to vice-president, in charge of production, stocks, and stores in all plants; R. L. Wilson from general superintendent to works manager, East Pittsburgh; E. R. Norris, director of works equipment, in charge of machinery, tools, and methods in the various plants; C. B. Auel, manager of employes' service department; G. M. Eaton, chief mechanical engineer; C. W. Johnson and H. W. Cope, assistant directors of engineering; C. H. Champlain and E. S. McClelland, assistant works managers; John E. Bonham, assistant to works manager; E. S. Brandt, supervisor of equipment and methods; managers of engineering departments—A. M. Dudley, automobile department; R. P. Jackson, material and process; F. E. Wynne, railway equipment department; and G. H. Garcelon, small motor.

Arthur E. Allen has been appointed district manager, at New York City, for the Westinghouse Electric & Manufacturing Co. He succeeds Edward D. Kilburn, who has been made vice-president and general manager of the Westinghouse Electric International Co.

Mr. Allen entered the service of the Westinghouse company in 1902. He is a native of Toronto, Canada, and served with the Canadian forces during the war, being commissioned a second lieutenant in the Royal Flying Corps.

Sidney Dillingham, Akron representative of Duffy & Sears, crude rubber brokers, New York City, began his rubber career in 1915 in the Federated Malay States where he spent one and one-half years with a European plantation company. He joined the Firestone Tire & Rubber Co., Singapore, Straits Settlements, Ltd., Singapore, Straits Settlements, in 1917 and remained there until 1918, acting in the capacity of rubber inspector and buyer. He left Singapore in 1918, coming to America where he enrolled in an officers' training school. After the armistice he entered the crude rubber department of the Firestone Tire & Rubber Co., Akron, Ohio, recently resigning to accept his present position.

Dr. A. Pirelli has been elected president of the Italian *Societa di Chimica Industriale* (Society of Chemical Industry) at Milan.

James Gustavus Whiteley, Belgian Consul at Baltimore, Maryland, has been appointed special representative in the United States for the Belgian Committee that is preparing, under the patronage of King Albert, the festival at Antwerp late this spring, to celebrate the Olympian Games.

H. H. Coleman, president of the Bergougnan Rubber Corp., Trenton, New Jersey, sailed for Europe on the steamer *La Lorraine*, January 20, to attend the annual Bergougnan convention at Clermont-Ferrand, France.

NEW JERSEY ZINC CO., INC., TO INCREASE PRODUCTION OF ZINC OXIDE AND LITHOPONE.

The New Jersey Zinc Co. announces that it will construct additional zinc oxide and lithopone plants to meet the growing demand for these products. Work will be started at once in Colorado and Pennsylvania. This company, said to be the oldest and largest zinc company in the United States, was organized in 1848 and includes among its properties the famous Franklin, New Jersey, mine which produces a pure zinc ore. The company is now operating zinc oxide, lithopone and slab zinc plants in Pennsylvania, Virginia, Illinois, Wisconsin, Kansas and Oklahoma. It has warehouses for its products in Brooklyn, Newark, Philadelphia, Pittsburgh, Cleveland, Chicago, Los Angeles, and San Francisco and intends to establish others. Its headquarters are in New York City and it has sales offices in Chicago and Pittsburgh.

With the manufacturing plants now in operation and those about to be constructed the company will be in a position to serve promptly and economically its trade throughout the country.

LINCOLN HIGHWAY ASSOCIATION ELECTS OFFICERS.

At the annual meeting of the Lincoln Highway Association, held recently in Detroit, Michigan, F. A. Seiberling, president of The Goodyear Tire & Rubber Co., Akron, Ohio, who has been president of the association for the past two years, refused to accept a third term, and Colonel Henry B. Joy, formerly president of the Packard Motor Car Co., who was the first president of the organization, was again unanimously elected president. Mr. Seiberling continues to be identified with the work of the association as one of its vice-presidents and a member of its executive committee.

The tire industry is further represented by J. Newton Gunn, president of the United States Tire Co., New York City, who was elected to the board of directors. Probably not less than $12,000,000 will be expended on the improvement of the Lincoln Highway in 1920, and the permanent marking of the route from Omaha to New York will be completed.

EASTERN AND SOUTHERN NOTES.

THE Firestone Tire & Rubber Co., Akron, Ohio, has made the following changes in the personnel of its eastern and southern branches: W. M. MacNichol, manager of Baltimore, Maryland branch, succeeding B. R. Leisure, promoted to be district manager, with headquarters in Philadelphia, Pennsylvania; E. D. Manley, manager of Washington, D. C., branch, succeeding W. M. MacNichol; L. L. Heidacher, manager of Memphis, Tennessee, branch, succeeding G. K. Meeks, transferred.

The McGraw Tire & Rubber Co., Cleveland and East Palestine, Ohio, has promoted B. P. Davis from the ranks of its salesmen to be manager of the McGraw branch at Memphis, Tennessee.

The Kokomo Rubber Co., Kokomo, Indiana, has purchased a site in Louisville, Kentucky, for its branch plant established there six months ago. It will build a two-story and basement structure, of which the lower floor will be occupied by the retail sales force.

The Katzenbach & Bullock Co., New York City, manufacturer and importers of chemicals and colors for the rubber trade, has opened a new office at 119 South Fourth street, Philadelphia, in charge of R. M. Smith.

The Stockwell Rubber Co., Inc., 229 North Twelfth street, Philadelphia, Pennsylvania, has been appointed sole agent of the Boston Woven Hose & Rubber Co., Cambridge, Massachusetts.

The Lineatime Manufacturing Co., Inc., Rochester, New York, manufacturer of the "Line-a-Time" copyholder having a number of rubber parts, has increased its capital from $50,000 to $150,000.

The Philadelphia Rubber Works Co., Philadelphia, Pennsylvania, is to erect a $4,000,000 reclaiming plant at Buffalo, New York, where it has purchased 97 acres of land on the Niagara river road. Construction has already begun on the first unit, which will have a capacity of 2,000,000 pounds per month finished weight of reclaimed rubber. The reasons given for going to Buffalo are the land available and the proximity to the water power of Niagara Falls. The company's plant at Akron will be maintained, the one at Buffalo being intended to take care of future expansion.

Tyrus Cobb, the baseball player, has been signed as a salesman for the Ty Cobb-Bill Sanford Tire Co., of Augusta, Georgia, distributors of Goodrich tires in the South.

The Courier Rubber Co., Inc., 150 Nassau street, New York City, has been established to push the sale of the Courier red floating inner tube. The officers are Robert E. Clift and William D. Laurie, president and vice-president, respectively, both formerly with Frazar & Co., 30 Church street, New York City, and Paul Cooksey, secretary and treasurer.

The Overman Cushion Tire Co., Inc., 250 West 54th street, New York City, will build a two-story addition to its factory, 50 by 138 feet, for use as a machine shop, service station, assembling and painting. It is expected that the new structure will be finished by May 1.

The K., F. & C. Tire & Rubber Corp., Roanoke, Virginia, has recently purchased 15 acres of property, with several buildings of reinforced concrete, at Roanoke, as a unit of its factory for the manufacture of its cord tire, which is neither a solid, pneumatic nor cushion tire, but a built-up tire of rubber, cords and cord fabrics such as are used in pneumatic tires. This was described in THE INDIA RUBBER WORLD, August 1, 1918. The company has patents in the United States, Great Britain, Canada and the other British colonies, France and Italy, and has applied for patents in other countries. The company expects to install $200,000 worth of machinery during the coming summer.

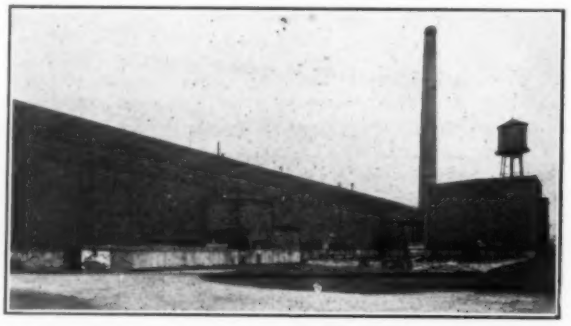
The Pennsylvania Rubber Co., Jeannette, Pennsylvania, has elected the following officers for the ensuing year: directors—Herbert DuPuy, H. Wilfred DuPuy, Charles M. DuPuy, Seneca G. Lewis, and George W. Daum; Herbert DuPuy, chairman of the board; H. Wilfred DuPuy, president; Charles M. DuPuy, vice-president; Seneca G. Lewis, vice-president and general manager; George W. Daum, assistant general manager; A. H. Price, treasurer; George W. Shiveley, secretary; James Q. Goudie, general sales director; C. G. Morrill, assistant treasurer; H. H. Salmon, purchasing agent.

In order to insure the carrying out of plans now under way for expansion in proportion to growth and to stabilize the policies of the company, a definite arrangement was made to retain Mr. Lewis for five years more, he having already completed ten years of service. As heretofore, the business will be built from the inside out and men and women promoted from the ranks when possible. Mr. Lewis is of the opinion that new plants should be built only to take care of the demand for the company's products and not before the business to run them has been obtained.

The Allen Machine Company, of Erie, Pennsylvania, has opened a New York office at 17 West 42nd street in order to care properly for their eastern and export trade. Morris A. Pearson, who is a well known rubber machinery engineer, is in charge.

The Akron Tire Co., Inc., Honeywell street and Skillman avenue, Long Island City, New York, has changed its name to Akron Overland Tire Co. and increased its capital stock $750,000. It was incorporated in October, 1919, under the laws of Delaware, with 100,000 shares of stock without nominal or par value.

The Farrel Foundry & Machine Co., Ansonia, Connecticut, has purchased at Buffalo, New York, where it will establish a new branch, the "Victory" turbine plant of the Bethlehem Shipbuilding Co. at Vulcan avenue and the New York Central railroad, at a cost of $431,000. This includes power plant, office, restaurant, welfare and hospital buildings, in addition to the main building 225 by 700 feet, and 12 acres of land. The company has also acquired 33 additional acres of land for expansion.



FARREL FOUNDRY & MACHINE CO.'S BUFFALO PLANT

The Poole Engineering & Machine Co. has removed its general sales office from 50 Church street, New York City, to its works at Baltimore, Maryland, where mail should be directed. It will still maintain a district office at the New York City address, however.

Taintor Trading Co., Inc., 9 State street, New York City, has incorporated to do a general trading business including the importation of chalk, English cliffstone, china clay, etc., under the management of Starr Taintor, president.

The Sinclair Rubber Co., Inc., 1679 Broadway, New York City, incorporated in September, 1919, has a factory at 2864 Webster avenue, where it manufactures a rebuilt tire which is intended to counteract the popular impression that rebuilt tires are unsatisfactory.

H. Schatia & Co., 100 Fifth avenue, New York City, are selling an Australian wool-filled fabric to manufacturers of raincoats in this country. It is of especially shaggy texture of a type current in prevailing English overcoatings and ulster cloths and offers in ten different shades. The manager of the fabrics for rubber clothing department is R. G. Bryant, a son of Geo. C. Bryant, formerly manager of the Chicago Rubber Clothing Co., Racine, Wisconsin, now operating in rubber clothing in Milwaukee under his own name.

RUBBER DIVISION OF THE AMERICAN CHEMICAL SOCIETY.

The Rubber Division of the American Chemical Society will meet in St. Louis, Missouri, April 14-15, and extends an invitation to all rubber chemists and technologists to attend. Since the rubber chemist has ordinarily to deal with technical problems not entirely chemical, much material is usually presented at these meetings which is of general interest. One such item to be discussed at the next meeting is the report of the committee on "Physical Testing."

Authors desiring to submit papers for presentation at the meeting should send the titles of the papers, together with abstracts, to A. H. Smith, Research Laboratory, The Goodyear Tire & Rubber Co., Akron, Ohio, by March 25.

THE RUBBER TRADE IN MASSACHUSETTS.

By Our Regular Correspondent.

BOSTON NOTES.

AS A RESULT of the exceptionally severe winter weather and series of blizzards which have visited this section during the past month, instances of profiteering in overshoe sales by retail dealers in the down-town district of Boston have been reported by inspectors for the state commission on necessaries of life, acting on a communication from Thomas J. Boynton, United States district attorney. Taking advantage of the abnormal conditions and a shortage of rubber footwear, some dealers were charging $5.50 or $6 a pair for overshoes that cost only $3.50 a pair. The usual and fair profit on such footwear, the commission asserts, is $1 per pair.

The Firestone "Ship by Truck" movement is being energetically organized and advertised throughout New England, and shippers are invited to make use of the information being compiled by the Firestone Ship by Truck Bureau at 656 Beacon street, Boston. Fourteen routes radiating in all directions from "the Hub" have been scheduled and large space in the local press is being devoted to listing the truck transportation companies operating on the various routes. The Massachusetts routes embrace Lowell, Springfield, Greenfield, Lynn, Brockton, Fall River, Haverhill and Lawrence, Marlboro and Hudson, and Cape Cod points. Other routes are to New York City, Philadelphia, Pennsylvania, Providence, Rhode Island; Manchester, New Hampshire, and Portland, Maine. Every route covers numerous smaller intermediate cities.

The employes' association of the Boston branch of the United States Rubber Co. held a most successful dance at Heineman Academy, Somerville, late in January. Some 400 persons were in attendance, including executives of the company. Novel dance numbers and other unusual features provided special entertainment. The committee in charge included Helen Cullen, Agnes M. Lintaman, Margaret H. O'Brien, Charles P. Abbott, A. A. Lappin and Roger Hewins.

The Hood Tire Sales Co., with stores at 1041 Commonwealth avenue, Boston, and in Watertown, selling Hood tires and tubes exclusively at wholesale and retail, has opened a downtown Boston branch in Park Square at the corner of Church street. Lewis B. Clay is in charge. D. J. MacNichol, president of the company, states that other stores will be opened as suitable locations can be secured.

At the annual meeting of the Franklin Rubber Co., 134 Federal street, Boston, held February 4, the following officers were reelected for the ensuing year: Asa C. Merrill, president; Everett L. Fuller, treasurer; Lorin L. Fuller, assistant treasurer. The company had a very successful year and is anticipating a large increase for 1920.

The Gillette Rubber Co., formerly at 110 Federal street, Boston, has sold its furniture and fixtures and gone out of business.

The recently organized Holland System Trading Corporation, 949 Commonwealth avenue, Boston, has become the exclusive New England distributer for the Overman cushion tire for trucks and is seeking live agents in every city of this territory.

Coburn, Kittredge & Co., 10 State street, Boston, is among the New England investment houses now specializing in rubber company securities.

H. O. Allyn, for several years at the head of the Springfield branch of the Pennsylvania Rubber Co., has been promoted to manager of the Boston branch. Mr. Allyn brings to his larger work long experience in the tire industry and an enviable record of able salesmanship.

The Boston branch of The Fisk Rubber Co. has a new manager in the person of Corliss Wadleigh, who has resigned as manager of the eastern department of the Youngstown, Ohio, organization of the Republic Rubber Corp., to assume his new duties. Mr. Wadleigh originally came from the Knox automobile sales forces, and although young in years is old in tire experience and has a wide acquaintance throughout New England.

L. Arthur Watkins, one of Boston's best known automobile accessory men, has been appointed to the New England district managership of the Globe Rubber Tire Manufacturing Co., with headquarters in Boston, succeeding A. H. Lane, who goes to the factory at Trenton, New Jersey, as distributers' representative.

The Madison Tire & Rubber Co., Inc., 30 East 42d street, New York City, has arranged to occupy the building at 859 Boylston street, Boston, now occupied by The Miller Rubber Co. This will be a direct factory branch in operation on March 1, in charge of J. H. Connor, formerly manager of the accessory department of the Packard Motor Car Co. of New England.

MISCELLANEOUS MASSACHUSETTS NOTES.

The Boston police appear to have unearthed a well organized plot to steal rubber goods from the Boston Woven Hose & Rubber Co., Cambridge, Massachusetts, obliterate the firm's name from the goods and then dispose of them through jobbing houses. Hose worth from $8,000 to $12,000 was seized in a Causeway street cobbler's shop and in the buildings of a High street concern by which it is alleged the hose had been distributed. It is believed, however, that systematic thefts have been in progress since last October, and that rubber goods worth $50,000 have been taken.

Following its usual custom, the Boston Woven Hose & Rubber Co., Cambridge, Massachusetts, on December 31, 1919, through its president, George E. Hall, presented gold pieces to such of its employes as had been with the company ten years or longer. Work was stopped at four o'clock and special exercises held, including a concert by the company band, an address of welcome by J. William Fellows, factory manager, and community singing.

Under the auspices of the Business Training Corporation, of New York, the Converse Rubber Shoe Co., Malden, is conducting a school for foremen and executives. The classes meet every two weeks, at which time the men get together at dinner to discuss problems in connection with their work. Among the subjects taken up are teamwork, handling labor, organization, machinery and materials, cost records.

At a meeting of the directors of the Plymouth Rubber Co., Canton, late in January, several of the former directors resigned, including the treasurer, J. E. Stone. A new board of officers and directors was then elected as follows: president, James J. Clifford; treasurer, Ronald T. Lyman; directors, James J. Clifford, Ronald T. Lyman, Nathan L. Amster, W. Lloyd Allen, Daniel H. Harris, W. F. Edlefson and John Sweetser. John J. Batterman, who has been handling the sale of Toesans for the company for some time past, was appointed sales manager.

The ebonite bowling balls made by the Stowe & Woodward Co., Newton Upper Falls, Massachusetts, have sold well this season in spite of prohibition, which was expected to interfere with the sport of bowling, as many alleys were attached to saloons. Robert J. Wilkie, who is connected with the company and is the originator of the ebonite bowling ball, states that some of these hard rubber balls have been used constantly for ten years.

The Athol Manufacturing Co., Athol, Massachusetts, has reorganized its Metropolitan Air Goods Department under the firm name of Metropolitan Air Goods Co., with L. S. Starrett as president and R. A. Whall, treasurer and manager. A two-story cement building will be erected as soon as weather permits, with every modern facility for making up pneumatic rubber goods, to take care of the increased business of this department.

THE RUBBER TRADE IN RHODE ISLAND.

By Our Regular Correspondent.

THE RUBBER MILLS throughout the state have been handicapped during the past month by the heavy snow-fall, ice and other weather conditions. All were hampered through the inability of employes getting to the plants on account of the impassable highways and by the freight embargoes which curtailed the shipping of materials and production.

The difficulty in moving supplies reached the climax in the great storm at the beginning of February and most of the plants were hard pressed for raw material. The National India Rubber Co. at Bristol was obliged to close its rubber shoe division for about a week, laying off more than 3,500 hands, naphtha being the principal commodity needed. But use was made of the men in clearing the highways between the plant and Warren, a distance of about five miles, to afford an outlet for the company's freight.

Besides these the general outbreak of influenza throughout the state was responsible for many employes not reporting for work. In several departments in some of the plants as high as 50 per cent were out at the height of the outbreak, and a number of deaths were recorded.

The Mount Hope Spinning Co., which manufactures fine yarns for tire fabric, at Warren, Rhode Island, is going to build a new mill in that town and work will be started as soon as the weather conditions permit. The new mill, which is to be located alongside the company's present plant on Cutler street, will be 200 feet in length and 110 wide and two stories in height.

The Mount Hope Spinning Co. a few years ago purchased one of the mills with storehouses and other mill buildings from the Cutler Mills Co., completely renovating all the property, and installed new machinery throughout. It has prospered from the start and for more than a year now the plant has been operated at capacity both night and day. When the new mill is completed the company will be in a position to double its output. This company also controls mills in Taunton, Massachusetts, and other places.

The Lynn Rubber Co., Warren, has absorbed the Morrison Brothers Heel Co., Boston, and in the future will manufacture not only rubber heels but other articles, such as arch supporters, etc. The consolidation of these two plants will double the capacity of the Lynn Rubber Co., and preparations are being made so that the plant can be operated day and night.

The annual meeting of the stockholders of the Lynn Rubber Co. was held at Warren, February 7, when the following directors were elected: Elmer K. Watson, J. William Long, Walter J. Howland, Clarence H. Seymour and Leonard P. Bosworth. At a subsequent meeting of the directors, J. William Long was elected president and Elmer K. Watson, treasurer. William Wheeler and F. M. Cartland, former president and treasurer, respectively, will in the future represent the company on the road and also serve in advisory capacities. No dividend was declared at the meeting.

The offices of the Lynn Rubber Co. will for the present remain in the Wilmarth building, on Main street, Warren, but in the near future accommodations will be made for the offices of the concern at the plant on Cutler street. Mr. Long, the new president, has a thorough knowledge of the business coming from Stoughton, Massachusetts, where he has been employed for several years as superintendent and head chemist with the Panther Rubber Co.

John F. Sweeney, who has been acting plant manager of the American Wringer Co.'s factory, Woonsocket, since the resignation of W. Maxwell Reed, some time ago, was made plant manager early the past month at the meeting of the directors. Mr. Sweeney has been with the American Wringer Co. since 1889, when he entered the employ of the concern as office boy and gradually worked his way up to his present position. He states that the plant is facing the most phenomenal year of its existence. Last year 500,000 wringers were turned out and this year it will be no surprise if 1,000,000 are made.

Henry C. Wagner, factory manager of the Woonsocket Rubber Co.'s plants in Woonsocket (the Alice Mill) and of the Manville Mills, at Manville, has been appointed general assistant to Myron H. Clark, general footwear factory manager of the footwear division of the United States Rubber Co. Mr. Wagner assumes his new duties March 1. Henry S. Marlor, now superintendent of the Lycoming Rubber Co. at Williamsport, Pennsylvania, will succeed Mr. Wagner as the factory manager of the Woonsocket Rubber Co.

Mr. Wagner started with the Meyer Rubber Co., at Milltown, New Jersey, and then went to Bristol, Rhode Island, where he occupied an executive position with the National India Rubber Co. He remained there three years and then went to Woonsocket, where he has been a resident for 15 years. He has served as superintendent at the Millville rubber boot mill at Millville and as superintendent of the Alice rubber shoe mill at Woonsocket at different times, and for a number of years has been factory manager and has been in charge of both of the Woonsocket Rubber Co.'s mills.

It is understood that The Ninigret Co., Pawtucket, manufacturers of fabric for automobile tires, contemplates the erection of a large addition to its present plant which was purchased about six months ago from the Greene & Daniels Co., since which time it has been running night and day to fill its orders which are said to be accumulating faster than they can be filled.

Employes of the Davol Rubber Co., Providence, have formed a mutual benefit association under the direction of the welfare department of the company, and a fund of $500 has been appropriated by the company in order that the association may start in a prosperous condition. Although membership is not compulsory, it is expected that a majority of the employes will join. Sick benefits will be paid at the rate of $1.25 per day for a period not exceeding 13 weeks and the death benefit will be $100. Group insurance was instituted by the company nearly two years ago.

The trade certificate of the Elliott Tire Shop, 143 High street, Pawtucket, has been filed at the city clerk's office, giving the name of Walter E. Elliott as owner.

THE RUBBER TRADE IN NEW JERSEY.

By Our Regular Correspondent.

THE WILL of Alfred Whitehead, secretary of the Whitehead Brothers Rubber Co., Trenton, has been admitted to probate in the office of the surrogate at Trenton. He left his entire estate to his widow. The real estate is valued at $20,000 and no inventory of the personal estate was filed.

The Empire Rubber & Tire Co., Trenton, has elected W. G. Heath and F. I. Reynolds to fill the vacancies on its board of directors caused by the resignations of J. E. Baum and J. Cornell Murray. W. M. Pepper has been elected president, succeeding Mr. Baum; F. I. Reynolds, vice-president; C. Edward Murray, Jr., vice-president and treasurer; H. R. Nason, secretary. The board of directors is as follows: General C. Edward Murray, chairman; W. D. Campbell, W. M. Pepper, W. G. Heath, C. Edward Murray, Jr., J. Frazier and F. I. Reynolds.

Associated with Mr Reynolds are: W. A. Reynolds, former sales engineer of the mechanical rubber goods division of the United States Rubber Co.; J. Baker Taylor, former general eastern district sales manager of the tire jobbing department of the United States Rubber Co., and R. V. Dickinson, who formerly occupied a similar position in the West for the same company.

S. H. Smith, formerly factory manager of the Gillette Rubber

Co., Eau Claire, Wisconsin, has been appointed factory manager of the Empire Rubber & Tire Co., Trenton.

J. Cornell Murray, formerly treasurer and a director of the Empire Rubber & Tire Co., Trenton, has associated himself with The Crescent Insulated Wire & Cable Co., Trenton.

The Crescent Insulated Wire & Cable Co., Inc., Trenton, has contracted for a one-story addition to its factory, 50 by 132 feet.

W. E. Sanders, of the Essex Rubber Co., Trenton, recently gave an address on "Rubber" before the Trenton Knights of Columbus. He told of the various processes the material goes through from the tree to the finished products.

The Delion Tire & Rubber Co., of Baltimore, Maryland, which purchased the name and good will of the Delion Tire & Rubber Co., of Trenton, is preparing plans and specifications for its new building. A nine-acre tract of land has been purchased along the West Shore railroad, where the erection of the new buildings will begin at an early date. The plant will cost more than $200,000, including buildings and power equipment.

The annual meeting of the Woven Steel Hose & Rubber Co., Trenton, was held February 2, when the following directors were elected: John S. Broughton, Karl G. Roebling, Horace B. Tobin, all of Trenton; John H. Janeway, of New York City, and Albert Rogers, of Philadelphia, Pennsylvania. The directors will meet later to elect officers.

John S. Broughton, president of the United & Globe Rubber Co., Trenton, has been appointed one of the commissioners to condemn land for the city for the erection of a new city wharf.

Bruce Bedford, president of the Luzerne Rubber Co., Trenton, and Mrs. Bedford will leave here early in March for a trip to Jamaica, West Indies, for several weeks.

Bruce Bedford, president of the Luzerne Rubber Co., has been appointed a member of the Trenton City Planning Committee, to aid in the development of Trenton.

William J. B. Stokes, J. Oliver Stokes and General C. Edward Murray, prominent rubber manufacturers of Trenton, have each contributed $25,000 towards the erection of a new $500,000 home for the Young Men's Christian Association. Clifford H. Oakley, president of the Essex Rubber Co., and C. Edward Murray, Jr., second vice-president of the Empire Tire & Rubber Corp., each contributed $500, while Horace L. Boyer gave $1,000. Horace B. Tobin, secretary and treasurer of the United & Globe Rubber Co., gave $500. General Murray was chairman of the general committee and spent considerable time in the work.

The Joseph Stokes Rubber Co., Trenton, will build a steel and brick addition to the plant on Taylor street. The structure will be two stories, 70 by 100 feet, and will cost $35,000.

Plans are being drawn for a three-story brick and steel building for the Ajax Rubber Co., Inc., Trenton. The structure will be 60 by 350 feet and will cost $39,000.

MISCELLANEOUS NEW JERSEY NOTES.

The Sterling Tire Corp., Rutherford, New Jersey, has increased its capital from $2,500,000 to $3,700,000. The company has 19 factory sales branches.

The Smith Rubber & Tire Co., Inc., 625 Main avenue, Passaic, New Jersey, has broken ground at Garfield, New Jersey, for its cord tire factory which is to be two stories high, 60 by 200 feet, with an initial daily capacity of 600 cord tires. The excavating and grading has been completed, the concrete foundations put in, and the concrete forms for the corner posts and side walls partially constructed. Machinery and equipment has been ordered and the date for delivery set. It is hoped the factory will be in operation by May 15.

The officers are: Winfield Clearwater, president; Fred W. Smith, vice-president; Dudley Gordon, secretary, and Thomas A. Hopkins, treasurer.

The Zee-Zee Rubber Co., Yardville, New Jersey, has increased its capital from $1,000,000 to $5,000,000 and expects to open 50 chain stores this year in addition to those already in operation. Irvin Zimmerman is president.

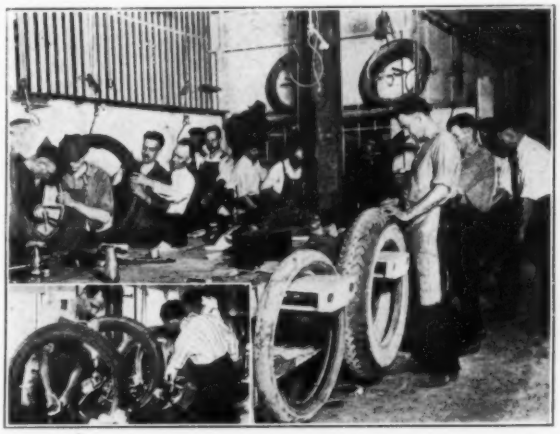
William G. Zimmerman, vice-president of the Zee-Zee Rubber Co., Yardville, who has been ill of pneumonia for several weeks at his home, has recovered and is now able to be about again.

The National Oil Products Co., Harrison, New Jersey, has elected M. A. Richards, formerly vice-president, its president, succeeding the resignation and withdrawal from the company of Arthur Phillips, the former president.

The Gibraltar Tire & Rubber Co., New York City, is having plans drawn for a modern rubber plant to be located in West New York, New Jersey. The plot has a frontage along the Hudson County boulevard of 90 feet and a depth of 150 feet. The company will engage in the manufacture of tires.

MILLER TIRE REPAIR SCHOOL A SUCCESS.

Many prominent tire men believe the time is not far distant when it will be necessary for the tire repair men to show proof of training and study under competent authority. Already there are being operated in Akron, Ohio, a few tire repair schools, among the largest of which is that conducted by The Miller



A SCHOOL FOR TIRE REPAIR MEN.

Rubber Co. This institution has averaged 35 graduates a month since last August and plans are nearly completed for doubling the size of the school.

Every graduate of the Miller school receives a diploma certifying that he has finished the regular course of instruction, consisting of lectures, text-book study, and practical repair work. The student is first made thoroughly acquainted with the details of tire construction before he is actually trained in repair work. Repair stocks, fabrics of all descriptions, air bags, vulcanizing machines and methods, common sources of tire trouble, etc., are among the subjects taken up. The chief instructor and his assistants in the school are thoroughly experienced tire men from both the factory and retail business standpoints.

Because of the great demand for the training, the course has been made as brief as is consistent with turning out expert tire repair men. It is said that the average man can complete it in a month. Some, however, require longer training. None is given a diploma until his work has passed the necessary high average standing. The wide interest taken in the school is evidenced by the class roll which shows students from nearly all of the states in the union.

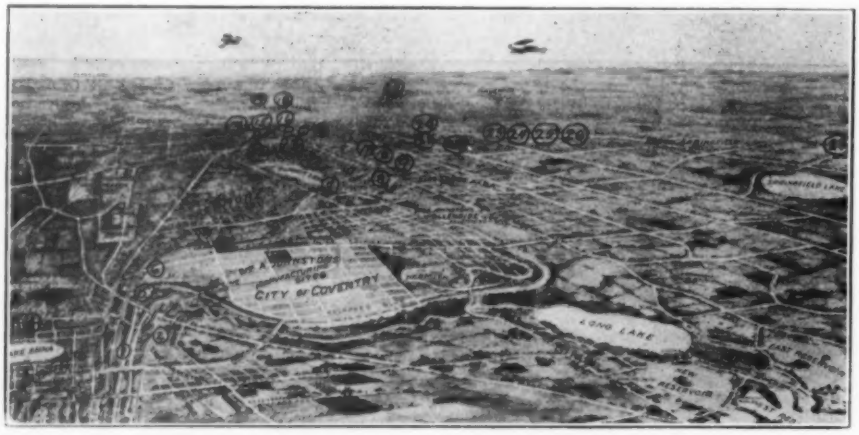
THE RUBBER TRADE IN OHIO.

By Our Regular Correspondent.

COVENTRY—AKRON'S NEW INDUSTRIAL CITY.

AN INTERESTING EXAMPLE of systematic and intelligent town planning is being carried out in the heart of the rubber district of Ohio, midway between the cities of Akron and Barberton, in the region known as "Greater Akron." It cannot be called an experiment because William A. Johnston, president of the Rubber Products Co., for many years has been developing the land in the vicinity of the Portage lakes into residential and industrial settlements, with the assistance of experienced landscape architects and of other experts, and already has Allenside and other communities to his credit.

For the present enterprise Mr. Johnston bought a tract of 350 acres of level ground, lying between the yards of the Pennsylvania and of the Erie railroads that serve the great rubber factories of the Akron district, together with the Belt line, on the one hand, and the bend of the Tuscarawas river on the other, and named the place Coventry. Across the river lies Allenside.



AEROVIEW OF COVENTRY IN GREATER AKRON, CENTER OF THE UNITED STATES RUBBER INDUSTRY.

1. AVALON RUBBER CO.
2. THE BILTWELL TIRE & RUBBER CO.
3. THE PORTAGE RUBBER CO.
4. RUBBER PRODUCTS CO.
5. THE LINCOLN RUBBER CO.
6. LAMBERT RUBBER CO.
7. WESTERN RESERVE RUBBER CO.
8. FIRESTONE TIRE & RUBBER CO.
9. THE MILLER RUBBER CO.
10. STAR RUBBER CO.
11. THE NA-PEER TIRE CO.
12. THE PHILADELPHIA RUBBER WORKS CO.
13. THE B. F. GOODRICH CO.
14. AMERICAN RUBBER & TIRE CO.
15. SWINEHART TIRE & RUBBER CO.
16. B. & W. RUBBER CO.
17. THE MARATHON TIRE & RUBBER CO.
18. FALLS RUBBER CO.
19. THE MASON TIRE & RUBBER CO.
20. THE GOODYEAR TIRE & RUBBER CO.
21. THE MOHAWK RUBBER CO.
22. KELLY-SPRINGFIELD TIRE CO.
23. THE PHOENIX RUBBER CO.
24. AMERICAN HARD RUBBER CO.
25. GENERAL TIRE & RUBBER CO.
26. THE AMAZON RUBBER CO.
27. THE INDIA TIRE & RUBBER CO.

The industrial end of Coventry has two miles of double portage on the Belt line, and is within easy walking distance of the Firestone Tire & Rubber Co.'s immense plant, of the Miller Rubber Co.'s reservation for new buildings, and of that of the Akron Rubber Mold & Machine Co. The Rubber Products Co.'s buildings are across the railroad track. The plan provides for mills and factories, schoolhouses, churches, motion picture theaters, a community center, business streets with restrictions on the buildings, a stadium, streets, sewers, water and all modern conveniences, and 1,500 house lots.

The accompanying aeroview shows not only the location of the town in reference to the neighboring rubber centers and to its own corner of Ohio, but also the astonishing number of noted rubber establishments that are grouped about it. It will be interesting to watch the career of the new-born Coventry.

AKRON NOTES.

Rubber manufacturing concerns in Akron are holding surpluses amounting to approximately $125,000,000 from distribution until the Supreme Court decides whether stocks issued against these surpluses are subject to the excess profits tax. If the Supreme Court hands down a decision permitting the issuance of the stocks without making them taxable, most of the rubber companies will issue stock. If the court holds they are subject to taxation, no par value shares will be issued.

Rubber manufacturers, builders and real estate men predict that Akron will become a city of tents and barracks this summer when the $40,000,000 construction program gets under way. There is not a man in the city of Akron out of work now, and there is scarcely a room, not to speak of a house, vacant in the city.

If the work planned for this year, both in the rubber industry, city building and the building of private residences is to be undertaken at all, the men to do the work must be brought to Akron from other cities and the only place for them to live while they are working will be in tents and barracks.

The Coventry Land & Improvement Co., subsidiary to the Firestone Tire & Rubber Co., will begin its building program in Firestone Park this spring with 300 new homes.

Rubber footwear factories have reported that a large number of representatives from Europe are coming to Akron to make contracts for the needs of their countries. The scarcity of leather has made the Europeans turn to rubber as the best substitute. Rubber heels and soles are especially in great demand in Europe, it is said.

Exports to foreign countries from Akron are now at the rate of approximately $20,000,000 a year. But for the high rate of exchange the amount would probably be double this figure.

Announcement has been made that Plant No. 2 of The B. F. Goodrich Co. will be ready to produce 3,000 tires daily, of small dimensions, within the next few weeks.

The Firestone Tire & Rubber Co., Akron, is educating its office employes by means of motion pictures. Sixteen films have been produced by the Division of Films, including "Most Miles Per Dollar," "The Rubber Industry in Malaysia," and "For the Common Good." Each series consists of five reels.

C. L. Mason, formerly western service manager, has been appointed manager of the north central district of the Firestone Tire & Rubber Co., with headquarters at Akron.

The General Tire & Rubber Co. is completing plans to take over permanently the coal mine which it leased during the coal strike and operated with rubber workers. Thirteen miles of track must be laid to the company's plant in order to produce and deliver coal economically.

The stockholders of The Miller Rubber Co. have approved the proposal of the directors that the capitalization of the company be raised from $20,000,000 to $60,000,000. The immediate issuance of $10,000,000 worth of the preferred stock has been decided upon. The business for the past year aggregated $26,495,482. Profits for the year amounted to $2,193,547.

The Mohawk Rubber Co., Akron, has increased its capitalization from $2,000,000 to $5,000,000. The purpose for which the

funds derived from the sale of the stock will be used has not been announced.

The Amazon Rubber Co. has been bought by a syndicate headed by Dr. E. E. Quirk, an Akron financier. The capitalization of the company is to be raised from $400,000 to $1,500,000 in order to finance a material increase in the output of the company. A new site has been obtained and the first unit of a new plant will be built this year.

The Doyle Tire & Rubber Co., Doyle Block, Akron, has organized with the following officers: Dayton A. Doyle, Jr., president and treasurer; Myron J. Sophy, vice-president and sales manager; F. H. Kelsey, vice-president; and Arthur W. Doyle, secretary.

The company will build a factory one story high with basement, 410 by 54 feet, on the Baltimore & Ohio railroad, in the suburbs of the East Akron district.

The H. B. Bixler Co., Ohio Building, Akron, organized by H. B. Bixler, a consulting engineer, has taken over and is operating the Denmead Rubber Co., a heel manufacturing company. The consideration for the plant is said to have been $160,000.

The following changes in personnel have been made at the factory of The Goodyear Tire & Rubber Co., Akron: James E. Hale, appointed manager of the rim and wheel department; William S. Wolfe, promoted from technical service division to head of tire design division; Walter B. Keith succeeding Mr. Wolfe.

With the promotion of I. R. Bailey, manager of the mechanical goods department of The Goodyear Tire & Rubber Co., to the position of assistant sales manager, two other changes in the Goodyear organization are announced. D. R. Burr, formerly assistant manager of the mechanical goods department becomes manager as successor to Mr. Bailey. Mr. Burr in turn is succeeded by C. A. Jones who has served as manager of the hose, railroad supplies and rubber band departments of the mechanical goods division.

C. A. JONES. I. R. BAILEY. D. R. BURR.

D. R. Burr has been with the Goodyear company since 1913, joining the company as assistant manager of the mechanical goods department of the Chicago district after having served in a like capacity and also as salesman for a competitive rubber concern. In June, 1916, he was transferred to Akron and made Mr. Bailey's assistant. Recently he returned from an eleven months' trip to Australia where he made an extensive industrial survey. Mr. Burr was educated at Columbus, Ohio, and started his business career there as a bill clerk with a wholesale hardware concern, later launching into business for himself in Miami County, Ohio, where he was engaged in the sale of mill supplies.

C. A. Jones is a "rubber city" product. He was born and educated in Akron, joining the Goodyear company eight years ago. Prior to that time he was with other rubber concerns in estimating cost work on rubber specialties and as assistant in charge of production. Mr. Jones joined Goodyear when the mechanical goods department consisted only of molded goods such as tiling, bumpers and rubber soles and heels, and sold the first thousand pairs of Goodyear rubber soles to shoe manufacturing concerns.

Duffy & Sears, crude rubber brokers, 133 Front street, New York City, have opened an Akron office in the Central Savings & Trust Building, with Sidney Dillingham in charge.

The Frank Dunbar Co., 610 Flatiron Building, Akron, dealing in crude rubber, has appointed George R. MacDonald assistant manager of the Akron office.

Albert V. W. Tallman, New York City, crude rubber broker, has opened an office at 512 Ohio Building, Akron, under the direction of George S. Schworm.

Nineteen nineteen, was a record business year for the Miller Rubber Co. of Akron, Ohio, sales having increased nearly $10,000,000 over the previous year. The sales which amounted to $1,914,443 in 1913 have risen to $16,522,707 in 1918 and $26,495,482 in 1919; it is now anticipated that in 1920 they will be at least $40,000,000. During 1919 new branches were established in Albany, New York; Cedar Rapids, Iowa; Charlotte, North Carolina; El Paso, Texas; Erie, Pennsylvania; Great Falls, Montana; Jacksonville, Florida; Memphis, Tennessee; Oakland and San Francisco, California. Since January 1, 1920, branches have been opened in Cincinnati, Ohio, and Phoenix, Arizona, and the establishment of branches in twelve other cities is being considered.

PLANT OF THE MILLER RUBBER CO., AKRON, OHIO.

The Akron shops of the Wellman-Seaver-Morgan Co. have taken on a complete line of rubber machinery and owing to the unprecedented demand they have run to full capacity for practically the entire year. The orders now booked will keep the shops running from six to seven months at the same rate, and to make deliveries some of this work has been transferred to the Cleveland shops.

CLEVELAND NOTES.

The Osborn Manufacturing Co., 5401 Hamilton avenue, Cleveland, has acquired the charter of the New York corporation of the same name. In November last, the Osborn company increased its capital to $2,000,000 and doubled its plant capacity. Branches and warehouses are maintained at New York, Detroit, San Francisco, Milwaukee, and Chicago. The company also maintains its own representative on foundry molding machines in Europe, in addition to its agencies which include The Allied Machinery Co. of America in France and Italy; Isbecque & Co. in Belgium; and J. W. Jackman & Co. in England.

The Owen Tire & Rubber Co., Cleveland, will increase its capital stock from $1,750,000 to $3,000,000 for the purpose of obtaining additional working capital and adding to its plant and equipment. It expects to have its new building ready for occupancy about July 1.

The Zenith Tire & Rubber Co., Leader Building, Cleveland, expects to build a factory in Cleveland for the manufacture of tires and tubes.

The Paralite Co. removes on March 1 from 609 Swetland Building to its new building at 1684 Columbus Road, Cleveland.

J. M. Bushey, formerly truck tire sales manager in Cincinnati, has been appointed Cleveland manager of the Firestone Tire & Rubber Co., Akron, vice P. M. Pontius, resigned.

MISCELLANEOUS OHIO NOTES.

The Firestone Tire & Rubber Co., Akron, has made the following changes in personnel in two of its Ohio branches: Cincinnati—J. P. Patterson, former manager, appointed manager of south central district, with headquarters in Cincinati; J. F. Evans, formerly trade sales manager, appointed manager of Cincinnati branch, succeeding Mr. Patterson. Toledo—G. F. Guin, formerly trade sales manager, appointed manager, succeeding G. E. Burkit, transferred.

The New Tread Tire Co., Columbiana, Ohio, at its annual meeting of stockholders voted to increase the capital stock from $100,000 to $500,000 to be issued in equal lots as to preferred stock. This is for the purpose of installing the necessary machinery and equipment for manufacturing a new tire. The following directors were elected for the ensuing year: S. W. Tidd (president), C. V. Calvin (secretary and treasurer), E. P. Altenburg (vice-president and general manager), E. L. Dieffenbacher, H. W. Hammond, W. O. Wallace, C. R. Heck, O. W. Altenburg. Officers were elected as indicated.

ERIC P. ALTENBURG.

The Rotary Tire and Rubber Co., Zanesville, Ohio, has increased its capital stock from $400,000 to $800,000. It began the operation of its new factory in October last and has a capacity of 300 tires a day, which the former capital was insufficient to finance.

The Eagle Rubber Co., Ashland, Ohio, has completed a new fireproof addition which doubles its floor space and capacity. This plant is equipped with modern machinery and ventilating appliances for manufacturing on a scientific basis and safeguarding the employes' health.

HEAD OF AJAX SANDUSKY PLANT.

WILLIAM W. MCMAHAN, who has been appointed vice-president in charge of the Sandusky, Ohio, division of the Ajax Rubber Co., Inc., is a veteran in the tire field.

In 1897 he entered the employ of Morgan & Wright, Chicago. He was soon made factory foreman, then factory inspector, then assistant superintendent and, in 1911, general factory superintendent. For nine years after joining Morgan & Wright, Mr. McMahan remained in Chicago. Then he was transferred to Detroit, where he remained until he was secured by Ajax Rubber Co., to assume complete charge of its Sandusky plant. In recent years Mr. McMahan has been general factory manager of the Morgan & Wright division of United States Rubber Co., first in charge of general production and later in charge of development.

WILLIAM J. MCMAHAN.

MID-WESTERN NOTES.

By Our Regular Correspondent.

STRESEN-REUTER & HANCOCK, INC., Chicago, Illinois, chemical manufacturer and broker, has elected the following officers for the ensuing year: F. A. Stresen-Reuter, president; A. S. Procter, vice-president; J. L. Biser, secretary and treasurer.

Mr. Stresen-Reuter, the newly-elected president, sailed from New York in January for an extended European business trip. Mr. Biser is in charge of the Chicago office in his absence.

The Birch Hintz Manufacturing Co., 1100-1110 South Kilbourne avenue, Chicago, Illinois, has dissolved partnership. John C. Hintz has severed connection with William T. Birch and will continue at the above address the manufacture of rubber molds and rubber mold machinery, under the name of The Hintz Manufacturing Co.

The Ilg Electric Ventilating Co., Whiting and Wells streets, Chicago, Illinois, has nearly completed an H-shaped two-story addition, approximately 200 by 300 feet, of concrete, which it expects to occupy by May 1. The company recently purchased the 10-acre tract of land on which the building stands and has provided for its water supply by an artesian well 200 feet deep. Oil-burning boilers will be installed in the factory and the company's own "Ilgair" unit heater system. This is the first of five units planned for erection during the next few years.

H. Thorpe Kessler has resigned as general manager of the Kinzie Rubber & Manufacturing Co., Chicago, Illinois, to manage the Modern Merchandising Co., a new Illinois corporation which he has founded and of which he is president. The new company deals in wearing apparel, including raincoats.

The Firestone Tire & Rubber Co., Akron, Ohio, has made the following changes in personnel in its mid-western branches: St. Louis—T. J. Barry, Manager, succeeding F. C. Rudisell, resigned; Denver, G. K. Meeks, manager; Detroit—G. E. Burkit, manager, succeeding R. H. Jeffers, promoted; Indianapolis—C. T. Barnes, manager, succeeding L. R. Jackson, promoted; Duluth depot—J. L. Bain, manager.

A controlling interest in the Mid-Continent Tire Manufacturing Co., Wichita, Kansas, has been purchased by The Zenith Tire & Rubber Co., Leader Building, Cleveland, Ohio, from which point most of the purchases for the Mid-Continent factory will now be made.

The International India Rubber Corp., South Bend, Indiana, has elected the following officers for the ensuing year: George W. Odell, president and treasurer; P. E. Studebaker, vice-president; B. F. Wulff, secretary, and G. W. Truxell and J. W. Ridge, directors, in addition to the foregoing.

THE MID-WEST RUBBER ASSOCIATION.

The February meeting of the Mid-West Rubber Manufacturers' Association was held at the Chicago Automobile Club, February 11, and was one of the largest and most enthusiastic that has been held by this association since its organization a year ago.

The new president, John T. Christie, of the Hawkeye Tire & Rubber Co., Des Moines, Iowa, was in the chair, and introducing the new general manager, H. S. Vorhis, formerly of The Rubber Association of America, and more recently of the Gutta-Percha & Rubber Manufacturing Co., New York City. Mr. Vorhis in a brief address outlined some of his plans for the development of an aggressive and helpful rubber association in the Middle West, and bespoke the cooperation of the entire membership to this end.

President John T. Christie then called upon a number of those present for brief remarks, among whom A. W. Caney, of The Achilles Rubber & Tire Co., Binghamton, New York, brought greetings from the Eastern contingent of the membership. W.

E. Byles spoke in an interesting manner of the proposed New York crude rubber exchange.

It was decided that future meetings of the association will be held on the second Tuesday of each month.

THE RUBBER TRADE ON THE PACIFIC COAST.

By Our Regular Correspondent.

SAN FRANCISCO NOTES.

THE UNITED STATES RUBBER CO., San Francisco Branch, has moved its headquarters from the location it has occupied for ten years at 50-60 Fremont street to its own building at 300-336 Second street, corner of Folsom. The structure is 137.6 by 275 feet, with two stories and basement, and is equipped in the most up-to-date manner. There is frontage on three streets and a spur track connects with the railroad.

The front of the second floor will be occupied by the executive offices of the Pacific Coast division which controls the operations of the fourteen Pacific Coast branches and, through a branch of the United States Rubber Export Co., Limited, the selling end of the company's business in the Hawaiian Islands, Alaska, Japan, India, Indo-China, the Federated Malay States, etc.

The Miller Rubber Co., Akron, Ohio, has opened a new branch in Oakland, across the bay from San Francisco. This is under the management of J. A. Hopkins, operating directly under the San Francisco branch. The territory includes several adjacent counties besides the City of Oakland.

The American Rubber Manufacturing Co., 356 Market street, San Francisco, manufacturer of mechanical rubber goods, is building an addition to its plant near Oakland. The estimated cost will exceed $100,000 when completed, which it is expected will be about the middle of the year.

The Wellman-Seaver-Morgan Co., Cleveland, Ohio, which recently discontinued its Seattle office, is taking care of business in that territory through its San Francisco office at 201 Rialto Building.

The San Francisco team of the Firestone Tire & Rubber Co. recently won against 64 branches the A. G. Partridge championship trophy in the national telegraphic bowling tournament, by bowling 2,758 pins. The same team also won the L. G. Fairbank cup in the second game for the highest team score for a single game. This is said to have been the first national telegraphic bowling contest, but it is expected that it will become an annual affair, so much interest having been shown.

L. R. Jackson has been promoted from the position of manager of the Indianapolis branch to that of the Pacific Coast district of the Firestone Tire & Rubber Co., Akron, Ohio, with headquarters in San Francisco.

LOS ANGELES NOTES.

Burgess Darrow has been appointed head of the technical service division of the Goodyear Tire & Rubber Co. of California, Los Angeles.

The United States Compression Inner Tube Co., a $5,000,000 corporation of Tulsa, Oklahoma, will erect a $1,000,000 factory in or near Los Angeles as soon as a site is decided upon and building materials are secured. It will be essentially a replica of the main Tulsa plant, which gives employment to several hundred workmen and has an annual capacity of 150,000 casings and 300,000 tubes. M. C. Hale, president of the company, is in Los Angeles perfecting plans for the project, and offices of the Pacific Coast division of the company have been opened in the Citizens' National Bank Building by C. R. Privett, distributor for California, Oregon, Washington, Utah, Idaho, New Mexico and Arizona.

SOUTHWESTERN NOTES.

The Savage Tire Co. of San Diego, San Diego, California, has changed its name to The Spreckels "Savage" Tire Co. The officers are: John D. Spreckels, president; Raymond V. Morris, vice-president and general manager; Claus Spreckels, secretary and treasurer; Read G. Dilworth, general counsel. L. S. Chamberlain, former Pacific Coast manager, has been appointed sales manager.

Although automobile casings will be manufactured in the new plant, the principal feature of production will be a patented puncture-proof inner tube.

The Miller Rubber Co., Arkon, Ohio, has opened a branch at Phoenix, Arizona, under the management of W. T. Smith.

The New York Rubber Co., 84-86 Reade street, New York City, has opened an office at 805 Franklin avenue, Houston, Texas.

The Fisk Rubber Co. of New York, Chicopee Falls, Massachusetts, has appointed C. C. Fletcher manager of its Texas district which includes San Antonio, Houston, Dallas and El Paso. Mr. Fletcher was for several years manager of the Fisk company's Oklahoma City branch.

For some years the Fisk Co. of Texas, now the Southern Equipment Co., handled the distribution of Fisk tires, together with accessories, in the State of Texas, but in December last The Fisk Rubber Co. of New York assumed the tire division, the Southern Equipment Co. taking over the accessory end. Practically the same personnel will be retained in the various Texas branches.

J. H. McDonnough, formerly district representative of the central district of the Firestone Tire & Rubber Co., Akron, Ohio, has been appointed manager of the southwestern district, with headquarters at Dallas, Texas.

NORTHWESTERN NOTES.

The Kelly-Springfield Tire Co., New York City, has opened a factory branch at 24-26 North Park street, Portland, Oregon, under the management of C. H. Mead. It also maintains other Pacific Coast branches at Seattle, Fresno, San Francisco and Los Angeles. The branch at Bakersfield, California, has been closed recently.

CANADIAN NOTES.

The United Shoe Machinery Co. of Canada, Limited, Montreal, Quebec, has in process of building a four-story factory addition, 60 by 120 feet. It is expected that the new building will be ready for occupancy about the first of April.

A million-dollar tire fabric plant, which will employ 1,000 hands, is to be built near Montreal by F. L. Jenckes, of the Jenckes Spinning Co., Pawtucket, Rhode Island, U. S. A., and other cotton men associated with him.

John Myles, general manager, and E. Larose, sales manager, respectively, of The Columbus Rubber Co. of Montreal, Limited, recently spent a week in Winnipeg on company business, with G. W. Barrett of the Winnipeg branch , and G. H. Connolly of the Calgary branch. Arrangements have been made to increase factory production to take care of the growing business of the company's western branches.

At the recent convention of the Shoe Manufacturers' Association of Canada, held in Quebec, an address on "A Freshman's Survey of Our Industry" was made by Talmon H. Rieder, president of Ames Holden McCready, Limited, Montreal, and one on "Machinery in the Shoe Trade," by F. W. Knowlton, president of the United Shoe Machinery Co. of Canada, Limited, Quebec.

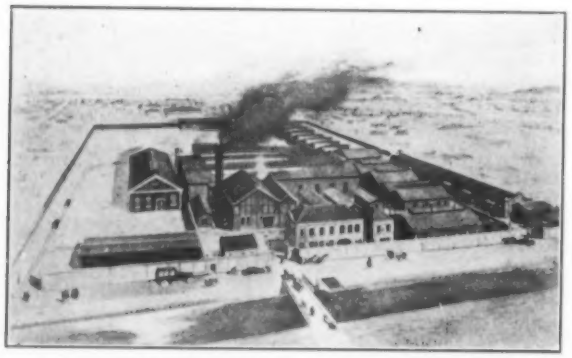
The employes of the Halifax branch of the Dominion Rubber System had the first annual sleighing party and dance on the evening of February 2, at the close of which a supper was served with rubber terms cleverly substituted for possible French ones in the menu.

The Rubber Trade in Japan.

By Our Regular Correspondent.

TRADE ASSOCIATIONS in Kobe and Osaka, Japan, seem to be geographically destined to prosper in commerce and industry, and since the World War, the Japanese rubber industry has made remarkable development, particularly in Osaka and Kobe. Osaka is the commercial and industrial center of the southwest half of Japan, including Korea, Formosa and southern Manchuria. Tokio is commercially the center of the northeast half of Japan. These cities are the largest markets and the distributing points for all commodities in their respective sections of the Empire, while Osaka is at present the chief trading place with Chosen and China, all Oriental countries and the South Sea Islands. Kobe, situated near Osaka, is the largest open port in the western half of Japan, and the biggest trading port of the Empire.

Thus important commercially and industrially as Osaka and Kobe are, they are juniors to Tokio in the history of the



KAKUICHI RUBBER CO., LIMITED.

Japanese rubber industry. The amount of crude rubber imports at Osaka had been very small until 1912 as compared with that of Yokohama.

The rubber manufacturing industry of Osaka began with the making of hot-water bags by the cold cure method in 1887. Ten years later, Mr. Sailer, a British Indian, came to Japan and manufactured some rubber articles by the hot cure method, but it gave no animation to the rubber industry. The Chino- Japanese war and the Russo-Japanese war, however, stimulated the rubber industry in Tokio somewhat, and these influences also extended to Osaka and Kobe. Several rubber factories were established in these cities, with the view of manufacturing mechanical goods, rubber balls, bicycle tires, hot-water bags, etc., but they were still in an experimental state.

Owing to the revision of the customs tariff in 1911, the Dunlop Rubber Co. (Far East), Limited, and the Ingram Rubber Co., which had been importing tires and medical instruments, established factories for the purpose of making these goods. Most manufacturers of medical instruments subsequently removed to Tokio, while tire makers still remained there and have made good progress.

During the World War, Japan had to meet home demands with home-made articles owing to the decrease of imports. The scarcity of rubber manufactures in China and the South Sea created a demand for articles of Japanese manufacture, especially tires. Consequently Kobe and Osaka have prospered more and more. For instance, the total amount of imports to Japan during the seven months from January through July, 1918, amounted to $3,507,000, of which $2,431,000 were Kobe imports. Osaka and Kobe exceed Yokohama in quantities of both imports and exports of rubber manufactures.

The objects and officers of the Osaka-Kobe Rubber Industry Association and of the Osaka Rubber Association, whose organization was noted in THE INDIA RUBBER WORLD, June 1, 1919, are as follows:

OBJECTS OF OSAKA-KOBE RUBBER ASSOCIATION.

(a) To protect credits and transactions of the members;
(b) To patronize trade-marks and inventions of its members;
(c) To conduct investigations and make proposals:
(d) To arrange arbitrations;
(e) To advocate rewards and encouragement for faithful employes;
(f) To exercise control over employes.

OFFICERS.

Chief manager, K. Yoshii, of the Kakuichi Rubber Co., Limited; standing manager and accountant, E. Kato, of the Settsu Rubber Co., Limited.

OBJECTS OF OSAKA RUBBER ASSOCIATION.

(a) To dun for payment;
(b) To suspend transactions with customers who refuse payment;
(c) To determine measures for those who infringe contracts with the members, also losses resulting from such infringement;
(d) To report on or to propose investigations ordered by the government;
(e) To encourage and control employes.

OFFICERS.

President, R. Nakamura; vice-president and accountant, S. Tsuji; managers, Iguchi, Limited, S. Iida, Nisshin & Co., Oishi Rubber Shop, Osawa & Co., S. Yoshikawa, T. Tanaka, Nakajima & Co., S. Muneda, Y. Miyakawa, Moriya & Co.

In April, 1919, both the Osaka Rubber Association and the Osaka-Kobe Rubber Industry Association held regular general meetings. No less than 70 members were present at the meeting of the former association at which addresses were made by the chief of Commerce and Industry Section, the deputy of the governor, the mayor of Osaka, the head of the Osaka Commercial Museum, the president of the Chamber of Commerce, the president of the Dunlop Rubber Co. (Far East), Limited, the president of the Tokio Rubber Association, and the president of Miyasaki & Co., of Tokio.

The following are the reports and matters decided at the meeting of the Osaka-Kobe Rubber Industry Association:

(a) The business report.
(b) Rubber manufacturers, especially tire manufacturers, should investigate concerning the total number of tires used in Osaka and Kobe and the western half of Japan.
(c) This association to write for the members when applications concerning commerce and industry (trade-marks, designs for practical use, patents, sanction for exports, various reports, etc.), are required. When trouble takes place in respect to these applications or reports, the association to be responsible.
(d) Purchase and sale of disposed goods and the introduction for newly invented or other novel articles, and new or old stock machines given special prices.
(e) Rewards, encouragement and guidance for workmen shall be entrusted to the officers.
(f) The financial report for last year, and consent for the estimate of 1919.

ASSOCIATIONS MAY UNITE.

These two associations have been considering amalgamation, and the Rubber Club was established with that very object. Apprehensive of the difference of opinion between manufacturers and tradesmen, however, some hoped to organize a legal association, consisting of manufacturers only, while others desired to establish an association of tradesmen. The Osaka-Kobe Rubber Industry Association finally applied independently to the Government in October, 1919, for the sanction of the Department of Agriculture and Commerce as the legal association of the principal rubber tradesmen. It is expected that the Osaka Rubber Association will also make a similar application at no distant date.

EUROPEAN NOTES.

OWING to a fire in the printing office in London on January 29, our esteemed contemporary, "The India Rubber Journal," is obliged to defer publication for a week, as all the manuscripts and materials were burned. A like calamity befell the "Waste Trade World," which was published at the same address, 37 and 38 Shoe Lane, London. Its special export issue must be postponed.

The British Rubber Tyre Manufacturers' Association, Limited, which controls the tire industry in Great Britain, has made proposals for standardizing tires that are being considered by the British Engineering Standard Association which will report on them shortly; they cover all classes of pneumatic and solid tires and rims. The Association denies that it has adopted the sizes agreed upon by a meeting of manufacturers in Paris, who represented England, France, Italy and Belgium.

The British Dunlop Rubber Co. through its subsidary, the Dunlop America Trust Pool, Limited, formed to establish and register Dunlop America Limited, holds 1,000,000 ordinary shares, or 25 per cent of the ordinary share capital of the American company, according to the "Financial Times" of London. It will have the right to nominate a majority of the board of directors, and any future issue of common stock will be subject to the right of the English company to secure 25 per cent of it at par. The English company will receive a fee equal to 10 per cent of the cost of erecting and equipping the American rubber mills and will also receive a royalty out of the net profits of the American company, which will be 6 per cent if the profits amount to $250,000 a year.

PROPOSED LONDON RUBBER CLEARING HOUSE.

London dealers in rubber and rubber shares are considering the establishment of a clearing house for rubber on the lines of the terminal markets now existing for coffee and sugar. Some years ago an effort was made to include rubber among the commodities dealt in by the London Produce Clearing House, but the trade was opposed to it.

The present movement has been strengthened by a large failure due to speculation at the close of 1919, when brokers and dealers felt that greater security was needed in speculative transactions. One section of the trade now favors a clearing house, which would be convenient for handling speculation in futures, as dealings would have to be settled at short intervals and actual buyers and sellers would be brought into contact. An equally influential section, however, opposes it, because it facilitates speculation. The rubber men will meet soon and decide the question.

BELGIAN NOTES.

Bungé et Cie., Antwerp, one of the oldest houses in the rubber business, has been converted into a joint stock company, Société Anonyme Bungé, with a capital of 30,000,000 francs in 3,000 shares of 10,000 francs each. The directors are Edouard Bungé, Georges Born, Willy Friling and Clément Swolfs and the managers are Eugène Friling and Carlo Spruyt.

From Belgium comes the report that the *Brussels Compagnie de l'Hevéa* and the *Antwerp Compagnie Financière des Caoutchoucs* are to amalgamate with the *Crédit Colonial et Commercial* of Antwerp, an export business with branches in London, New York, and Buenos Aires, to be capitalized at 80,000,000 francs.

ANTWERP EXHIBITIONS IN 1920.

The Olympic Games will be celebrated at Antwerp this year, under the patronage of King Albert. In connection with them, an international exhibition of motor cars will be held from May 15 to June 13, under the patronage of the Syndical Chamber of the Automobile and the Royal Automobile Clubs of Belgium. It will include seven classes, as follows: (1) Complete motor cars and chassis; (2) motor car carriage building and its elements; (3) automobile trade; (4) tires and wheels; (5) manufacturers of accessories, mechanical parts and separate pieces for motor cars; (6) accessories, mechanical parts and separate pieces for automobile trade; (7) iron and steel works and foundries relating to the automobile industry.

There will also be held at Antwerp an international exhibition of commercial and agricultural tractors, camions and motors, from June 26 to July 25, and an international exhibition of sports, sidecars, motorcycles, cycles and accessories, from August 7 to September 15. The Belgian Custom House will admit foreign exhibits free and every possible facility will be given to foreign exhibitors. All information and application forms may be obtained from the special representative in the United States, James Gustavus Whiteley, Belgian Consul, 223 West Lanvale street, Baltimore, Maryland.

JAVA'S ENGINEERING CONGRESS.

Brief mention was made in the October number of THE INDIA RUBBER WORLD of the General Engineering Congress to be held at Weltevreden, near Batavia, Java, May 8 to 15, 1920, under the patronage of the Governor-General of the Netherland Indies.

Among the papers promised that are of special interest to the rubber industry are:

"Life of Submarine Cables," by M. P. L. G. Hansen, M. E., engineer at the Post, Telegraph and Telephone Service. "Development of the Submarine Cable System," (author not announced). "The Relation between Vulcanizing Time and the Quality of Final Product in Rubber Manufacture," by Dr. O. de Vries, director of the government rubber experimental station in the Netherland Indies. "Practical Use of Artificial Accelerators for Rubber Vulcanization," by A. Brzesowsky, chemical engineer of the Netherland Indies rubber factory, Bandoeng.

There will be papers also by Dr. P. van Leersum, formerly director of the government rubber plantations, and L. A. van Ryn, general manager of the Netherland Indies rubber factory.

Following this congress, an industrial fair will be held at Bandoeng, where manufacturers of tools, machinery, bicycles, motor cars, and domestic goods of all kinds, may exhibit their products.

Arrangements will be made for trips in Java, so that those attending the congress may visit important engineering works, and the places of interest of the island, like Buitenzorg, with its famous botanical gardens and museum, a rubber estate at Bandjar, and the rubber factories at Bandoeng.

The *Société Générale des Etablissements Bergougnan* whose American branch is the Bergougnan Rubber Corp., Trenton, New Jersey, has been holding the annual convention of department heads at Clermont-Ferrand, France. The company has manufacturing plants in France, Italy, Russia and the United States, plantations in Indo-China and branches in all the countries of Europe, in North, Central and South Africa, South Africa, South America, Canada, Mexico, India, the Straits Settlements, China, Japan, Australia, New Zealand and Tasmania.

Recent Patents Relating to Rubber.

THE UNITED STATES.

ISSUED JANUARY 6, 1920.

No. 1,327,180. Demountable rim for tires. H. Stinemetts, Calgary, Alberta, Canada.
1,327,251. Puncture tester for tires. F. Overmyer, Toledo, Ohio.
2,327,408. Brassière with elastic waist zone. M. W. Schloss, assignor to Treo Co., Inc.—both of New York City.
1,327,428. Adjustable shower-spray device. G. H. Gregory, East Orange, N. J.
1,327,503. Reinforced pneumatic tire. W. I. Varner, Athens, Ga.

ISSUED JANUARY 13, 1920.

1,327,705. Vaginal douche. C. W. De Long, Gainesville, Fla.
1,327,717. Resilient tire cushion consisting of a rope-like core of twisted strands, each strand composed of twisted plaits, and each plait consisting of plaited flat strips of waste rubber. E. McDowell, Atlanta, Ga.
1,327,729. Fountain pen. B. S. Paschall, New York City.
1,327,757. Rubber tooth-brush. W. J. Eggers, Brooklyn, N. Y.
1,327,794. Tire filled with concentric layers of hose and tubing having central core. F. L. Wadham, Detroit, Mich.
1,327,912. Tire tread for pneumatic tire casings and method of making and attaching. O. J. Hobson, assignor of one-half to O. O. Beckworth—both of Chicago, Ill.
1,327,922. Draftsman's fountain ruling-pen. E. R. Moreland, Carrollton, Mo.
1,328,054. Reinforced pneumatic tire. H. Nicholson, Chicago, Ill.
1,325,154. Cushion heel. J. Jackerson, Brooklyn, N. Y.
1,328,215. Fountain pen with lever-filler. De W. C. Van Valer, assignor of one-half to H. W. Geyer—both of New York City.

ISSUED JANUARY 20, 1920.

1,328,301. Bread-board with rubber feet. L. W. Serrell, New York City.
1,328,406. Shaped sanitary belt. A. T. Van Alstyn, Grand Rapids, Mich.
1,328,407. Machine for embossing without dies having rubber carrier apron. F. W. Virkus, La Grange, Ill., assignor to Wood, Nathan & Virkus Co., New York City.
1,328,564. Resilient heel or heel-lift. R. I. Hill, assignor, by direct and mesne assignments, to The Hill Rubber Co.—both of Elyria, Ohio.
1,328,605. Demountable split rim for tires. J. H. Wagenhorst, Akron, O., assignor to The B. F. Goodrich Co., New York City.
1,328,632. Spring tire. F. W Kremer, Rutherford, N. J.
1,328,731. Demountable rim for tires. C. C. Harbridge, Detroit, Mich.
1,328,757. Rubber overshoe for tires. B. J. Mullikin, New York City.
1,328,779. Cushion wheel. G. R. Barker, Chicago, Ill.
1,328,801. Dust-cap for tire valves. J. A. Bowden, Los Angeles, Cal.

ISSUED JANUARY 27, 1920.

1,328,931. Garter. W. H. Stevens, New York City.
1,329,126. Adjustable dust cap for tire valve stems. F. Leming, Hingham, Mass.
1,329,146. Dust-cap valve for tires. H. G. Slater, Los Angeles, Cal.
1,329,182. Valve-cap for tires. E. E. Holt, assignor to Holt Auto Devices Co.—both of Chicago, Ill.
1,329,208. Air bag. P. Powell, assignor of one-half to J. Rosenfield—both of Boston, Mass.
1,329,215. Resilient tire. P. J. Westergaard, Reinbeck, Iowa.
1,329,289. Demountable rim for tires. D. R. Carter, Washington, D. C.
1,329,310. Inflated golf-ball and process of manufacture. F. T. Roberts, assignor to The Aranar Co.—both of Cleveland, Ohio.
1,329,331. Cushion-tire. C. S. Wert, Kendallville, Ind.
1,329,339. Rubber bumper for closet seats, etc. J. R. Gammeter, Akron, Ohio, assignor to The B. F. Goodrich Co., New York City.

THE DOMINION OF CANADA.

ISSUED JANUARY 6, 1920.

195,699. Pneumatic tire casing. B. E. Bliss, Wichita, Kansas, U. S. A.
195,710. Soft rubber eye wiper. C. B. Carr, New York City, U. S. A.
195,744. Pneumatic tire. I. Greenberg, Baltimore, Maryland, U. S. A.
195,762. Tire armor with rubber tread. A. E. Jennings, Owensboro, Ky., U. S. A.
195,891. Demountable rim for tires. The Parker Collapsible Rim Corp., Ill., assignee of L. P. Woodbury, Berkeley, California—both in U. S. A.

ISSUED JANUARY 13, 1920.

195,936. Armored pneumatic tire. A. L. Fry, Lisco, and F. C. Nagel, Ulysses, both in Nebraska, U. S. A.
195,978. Pneumatic tire with removable tread. S. R. Campbell, Toronto, Ont.
196,156. Resilient wheel with pneumatic hub. The Gudgell's Rubber Hub Co., assignee of L. Gudgell, both of Rock Island, Ill., U. S. A.
196,200. Demountable rim for tires. C. Hauptman, assignee of C. A. Tripp, both of Mojave, Calif., U. S. A.

ISSUED JANUARY 20, 1920.

196,260. Clincher rim for tire blocks. P. J. Hamill, Jerome, Pa., U. S. A.
196,352. Valves for tires. H. A. Wood, Kingston, Ont.
196,353. Spring tire. S. Woodall, née Switzer, administratrix, Winchester, Ill., U. S. A.
196,473. Blow-out patch of rubber-coated wire fabric. L. P. Clark, Fanwood, assignor of a half interest to A. L. Stebor, Jr., Plainfield—both in New Jersey, U. S. A.

ISSUED JANUARY 27, 1920.

196,481. Resilient tire. A. J. Ostberg and A. Kenny, Richmond, near Melbourne, Victoria, Australia.
196,485. Resilient tire. F. E. Allen, Port Huron, Mich., U. S. A.
196,500. Tire inner tube protector. H. S. Blynt, Yale, Okla., U. S. A.
196,503. Spring tire. C. H. Braden, Los Angeles, Calif., U. S. A.
196,517. Life preserver. D. Del Re, Iron River, Mich., U. S. A.
196,533. Tire. M. C. Frank, Piedmont, Calif., U. S. A.
196,561. Bicycle rim. A. C. Bailey, Vancouver, Wash., U. S. A.
196,582. Reinforced pneumatic tire. J. F. Robinson, Los Angeles, Calif., U. S. A.
196,601. Pneumatic clincher tire. H. van der Linde, Toronto, Ont.
196,640. Face veil with elastic cord in edge. The Bonnie-B Co., Inc., New York City, assignee of I. Silverberg, Far Rockaway—both in New York.

THE UNITED KINGDOM.

ISSUED JANUARY, 7, 1920.

134,668. Parachutes with fabric and rigging cords held in place by elastic cords. M. H. Spencer, Balloon Training Base, Sheerness.
134,671. Wheel tires, composed of alternate layers of bands and blocks of rubber covered with a leather tread. W. C. Bilham, 115 Avenue Road, Itchem, Hampshire.
134,743. A revoluble holder to attach to heels for holding renewable wearing parts of rubber. J. Smith, Belle-Vue Bungalow, Poulton Road, Fleetwood, Lancashire.
134,748. Divisible rims for tires. J. Milne, Allermuir, Braid Road, Edinburgh.

ISSUED JANUARY 14, 1920.

134,983. Fountain tooth brush. J. A. Hunter, 21 Church House, Belfast.
135,071. Resilient wheel tires. A. C. and N. Jonassen, Whakatane, N. Z.
135,129. Athletic boot with shock-absorbing rubber pad. J. J. Hartopp, Rutland street, Leicester.
135,133. Endless driving belt for automobile fans. C. C. Gates, 999 South Broadway, Denver, Colo., U. S. A.

ISSUED JANUARY 21, 1920.

135,337. Parachutes with rubber distance pieces on netting to prevent damage to fabric. H. Blackburn, 15 Axholme Road, Wheatley, Doncaster, Yorkshire.
135,417. Rubber soles provided with recesses for attachment by cement. J. Brandwood, Brandlesholme, Bury, Lancashire, and A. Thill, 33 Upper Bedford Place, London.

ISSUED JANUARY 28, 1920.

135,494. Pressure gage for pneumatic tire. Protex Manufacturing Co., 1916 West Lake street, assignee of A. E. Pollock—both of Chicago, Ill., U. S. A. (Not yet accepted.)
135,495. Pressure gage for pneumatic tire. Protex Manufacturing Co., 1916 West Lake street, Chicago, Ill., assignee of A. M. Sonnichsen, Milwaukee, Wis.—both in U. S. A. (Not yet accepted.)
135,546. Sponge rubber air cushion for covering airplane or vehicle parts to prevent injury to occupants by collision. A. H. Parrott, 87 Cornwall street, and H. Round, 141 Great Charles street, both in Birmingham, and R. H. Davis, 187 Westminster Bridge Road, London.
135,555. Stiffener for rubber boot and shoe soles, impregnated with or carrying phenolic condensation cementing material or bakelite. (See also British patent No. 135,806.)
135,708. Rubber heel with tubular flanged sockets embedded therein for insertion of nails for attachment. G. H. Hickson, Rosedene, Austin avenue, Stockton-on-Tees.
135,741. Pressure gage for pneumatic tire. H. M. Schwab, 827 West Main street, Louisville, Kentucky, U. S. A.
135,742. Inflation valve for footballs. A. Raycraft, 10 Ferry Lane, Wouldham, near Rochester, Kent.
135,756. Tire valve arranged transversely to wheel. F. W. Lanchester, 41 Bedford Square, London.
135,798. Demountable rim for tires. L. Johnson and J. T. Roberts, 12 King Henry's Walk, London.
135,806. Reinforced rubber shoe sole. (Reference is also made to British patent No. 135,555.) H. C. Egerton, 31 Hampton Place, Ridgewood, and H. L. Duncan, Mahwah—both in New Jersey, U. S. A.
135,841. Demountable rim for tires. The Goodyear Tire & Rubber Co., assignee of J. B. Atkins, 366 North Arlington street—both of Akron, Ohio, U. S. A. (Not yet accepted.)

THE FRENCH REPUBLIC.

PATENTS ISSUED, WITH DATES OF APPLICATION.

492,013. (February 18, 1919.) Tube for airplane motor, made of rubberized tissues instead of rubber. Joseph Ameil and Maurice Coquilhat.
495,279. (January 29, 1919.) Resilient wheels for automobiles. J. de Acuña.
495,309. (June 5, 1915.) Improvements in rubber tires. Estes Airless Tire Co., M. F., J. M., and E. S. Amonett.
495,625. (February 6, 1919.) Rim for tire. B. F. C. Haanel.
495,643. (October 2, 1917.) Pneumatic tubes for wheels of vehicles and especially of airplanes. C. Suteau.
495,615. (February 6, 1919.) Rubber trimming for soles of footwear R. Catin.
496,743. (March 8, 1919.) Valve for pneumatic tire. A. Schrader's Sons, Inc.
496,849. (March 11, 1919.) Improvements in solid rubber tires. The Dunlop Rubber Co., Limited.
496,850. (March 11, 1919.) Improvements in solid rubber tires. The Dunlop Rubber Co., Limited.
495,868. (February 18, 1919.) Sterilizing nipple. C. Quillemin.
496,076. (January 2, 1918.) Captive balloon of great height with provision for elastic automatic change of shape. L. Avorio.
495,979. (January 30, 1919.) Chewing gum. S. W. Cramer.
496,134. (November 6, 1918.) Resilient tire. F. Andersen.
496,278. (March 5, 1918.) New material for insulating electricity and the process for making it. G. Lebeau.
496,369. (February 28, 1919.) Improvement in rubber stamps. F. Pitman.
496,512. (March 31, 1916.) Valve for pneumatic tire. A. Gibouret.
496,605. (February 5, 1919.) Extensible elastic wheel. O. Vannay.
496,684. (March 7, 1919.) Inner tube for pneumatic tire. H. N. Wayne.
497,327. (March 19, 1919.) Nipple. A. Jackson.
497,391. Valve for pneumatic tires. F. H. Veugelers.

Chemical Patents will be found on page 361. Machinery Patents on page 364.

GERMANY.

PATENTS ISSUED, WITH DATES OF APPLICATION.

318,601. (June 9, 1916.) Resilient tire. Siemens & Halske, Siemensstadt, near Berlin.

318,715. (January 20, 1918.) Rubber pneumatic tires for motor cars. Albert Witzel, Ludwigburg.

319,315. (July 13, 1918.) Elastic tire for vehicle wheels. Carl Haubold, Chemnitz, Saxony.

TRADE MARKS.

THE UNITED STATES.

NO. 106,212. Representation of an inverted T-square with rounded ends and corner—rubber and composition soles and heels. The Marathon Tire & Rubber Co., Cuyahoga Falls, O.

111,500. The words CRAVA-DUSTA—raincoats of rubberized and other waterproofed material. James Harbert, Polson, Mont.

114,966. Representation of Maltese cross enclosing two concentric circles banded horizontally across the front—asbestos and rubber clothing, gloves, mittens, leggins, etc., for firemen. American-La France Fire Engine Co., Inc., Elmira, N. Y.

116,223. The word KLENZO—druggists' rubber goods. United Drug Co., Boston, Mass.

118,653. The word CARDINAL and a representation of a cardinal bird sitting on a tree-limb, the bird being red with a black portion near the eyes, and the limb blue—inner tubes. Spencer Carroll Co., Dallas, Tex.

118,755. The word ELASTO—girdles, hip-reducers, corsets, and other reducing garments. The Elastowear Manufacturing Co., Cincinnati, O.

119,756. Representation of a seal bearing the initial G and the words, GORMAN'S HONEST SHOES—men's, women's and children's shoes, boots and slippers of leather, cloth, rubber, or a combination of two or more of these materials, etc. Medora A. Feehan, Haverhill, Mass.

118,935. The word WONDERWEB—suspenders, garters, woven elastic belts, etc. Rice-Stix Dry Goods Co., St. Louis, Mo.

118,977. Representation of a goat climbing a mountain—composition soles and heels for boots and shoes. Armstrong Cork Co., Pittsburgh, Pa.

118,978. The words MOUNTAIN GOAT—composition soles and heels for boots and shoes. Armstrong Cork Co., Pittsburgh, Pa.

119,071. Representation of a roller passing through the D and A of the word IDEAL—rollers for printing presses, typewriters, paper, textile, and metal coating, inking and coloring machines; proofing in printing and lithographing, etc. Ideal Roller Co., Chicago, Illinois.

119,204. The word OMO, having a pair of wings outspread from the top points of the M—sanitary belts and aprons and surgical gum tissue. The Omo Manufacturing Co., Middletown, Conn.

119,205. The word OMO—sanitary belts and aprons and surgical gum tissue. The Omo Manufacturing Co., Middletown, Conn.

119,711. The words PIED PIPER—children's shoes of leather, rubber, fabric, and combinations of such materials. Marathon Shoe Co., Wausau, Wis.

119,971. The words BIG NINE—boots and shoes of rubber, canvas, or combinations. Converse Rubber Shoe Co., Malden, Mass.

120,222. The words NATURE TREAD—insole with rubber pad. A. Buckland Plummer, Chicago, Ill.

120,303. Representation of a label edged with a pad-locked link-chain and bearing the figure of a man within a colossal garter, adjusting the fastening, accompanied by the words SURE HOLD SURETY GARTER—hose supporter. Ely & Walker Dry Goods Co., St. Louis, Mo., and New York City.

121,494. Representation of a stencil bearing the words: R. T. VANDERBILT CO., N. Y., WHITING, AMERICAN PRODUCTS—whiting, a carbonate of lime used as a filler in rubber goods. R. T. Vanderbilt Co., Inc., New York City.

121,605. The word USKIDE—shoe soles made at present of rubber and fiber. Revere Rubber Co., Providence, R. I.

121,748. The words ONE-IN-ALL "IN THE RAIN"—waterproof coats and slickers. James T. Caradine, St. Louis, Mo.

121,949. The word Usco—dental dam, surgeons' rubber gloves, seamless nipples and nipples for use in nursing sheep. United States Rubber Co., New Brunswick, N. J., and New York City.

122,023. Representation of label bearing bust of athlete beneath the word POLSON—rubber tires, tubes, patches, boots, flaps, treads, pads, valve bases, reliners and rubber belting. The Polson Rubber Co., Cleveland, O.

122,156. Representation of a bear and the words BAER TRADE MARK—collapsible tire rim. Baer Collapsible Rim Corp., San Francisco, Calif.

122,302. Representation of a seal bearing the figure of a hobby-horse in silhouette and the word HOB—baby pants, rubber diapers, etc. Hob Manufacturing Co., New York City.

122,826. The word JAX—rubber heels and soles. Double Suction Rubber Heel & Sole Co., Baltimore, Md.

122,889. The words—THE BLUE RIDGE SHOE—boots and shoes of rubber and fabric, etc. Griggs-Paxton Shoe Co., Inc., Roanoke, Va.

123,201. The word DIAMOND over a black diamond—billiard and pocket-billiard balls. The Brunswick-Balke-Collender Co., Wilmington, Del., and Chicago, Ill.

123,330. Representation of a rubber heel bearing the words TWIN WEDGE—rubber heels. Barva Heel & Tire Factory, Inc., Fort Wayne, Ind.

125,001. The word FLEXYDE—imitation leather. The Marathon Tire & Rubber Co., Cuyahoga Falls, O.

WITHDRAWALS.

128,611. The word CLIMAX—rubber footwear, etc. Apsley Rubber Co., Hudson, Mass. (Application serial No. 120,734 published in THE INDIA RUBBER WORLD, December 1, 1919.)

THE DOMINION OF CANADA.

25,431. The word KNICKERBOCKER—rubber goods of all kinds except boots and shoes. Van der Linde Rubber Co., Limited, Toronto, Ont.

25,432. The word CHALLENGE—rubber goods of all kinds except rubber footwear, golf balls and hockey balls. Van der Linde Rubber Co., Limited, Toronto, Ont.

25,437. The word AGRIPPA—goods manufactured of rubber and gutta percha. J. G. Ingram & Son, Limited, London India Rubber Works, Felstead street, Hackney Wick, London, N. E., Eng.

25,457. The words THE STANDARD arranged on a central line or band with relatively short transverse lines or bands uniformly spaced and of the same length—Automobile tires and tire cases. F. E. Partridge Rubber Co., Limited, Guelph, Ont.

25,468. The words WATERPROOF, 2 IN 1 COAT—all kinds of waterproof clothing. The Montreal Waterproof & Clothing Co., Limited, Montreal, Que.

25,480. A red disk—fountain pens. The Evans Dollar Pen Co., Waterloo, O., U. S. A.

25,482. The word PALATINE—rubber heels and solid and pneumatic tires. Leyland & Birmingham Rubber Co., Limited, Golden Hill Works, Leyland, Lancashire, Eng.

25,483. The word DIAMOND and the representation of a diamond—billiard and pocket-billiard balls. The Brunswick-Balke-Collender Co., Chicago, Ill., U. S. A.

25,484. The word MAXOTIRE—liners or inside tires for pneumatic tires. K. & W. Rubber Co., Delaware, O., U. S. A.

25,490. The word RESILIA—garment supporters. The Resilia Manufacturing Co., Cambridge, Mass., U. S. A.

25,507. Representation of a winged foot between the two syllables of the word GOODYEAR—rubber or composition heels. The Goodyear Tire & Rubber Co. of Canada, Limited, Toronto, Ont.

25,520. The word FERFECORD—pneumatic tires. Perfection Tire & Rubber Co., Inc., Fort Madison, Ia., U. S. A.

25,524. The word OXIMONY—dry colors for painters. E. M. & F. Waldo, New York City.

25,525. The word BASOFOR—chemical used as a base for paint and enamels. E. M. & F. Waldo, New York City.

25,547. The words WRIGLEY'S NIPS with the figure of an elf holding a box, on each side—chewing gum, etc. Wm. Wrigley, Jr., Co., Limited, Toronto, Ont.

25,551. Representation of a girl's head within a circle and the words SWEET SIXTEEN—chewing gum, etc. Wm. Wrigley, Jr., Co., Limited, Toronto, Ont.

25,555. The word BRUNSWICK—rubber or rubber and fabric tires and tubes. The Brunswick-Balke-Collender Co., Chicago, Ill., U. S. A.

25,591. The word CUP—goods, except tires, manufactured from rubber and gutta percha. G. W. Beldam, Boston, Lodge, Windmill Road, Ealing, County of Middlesex, Eng.

25,657. The words STAR HAND MADE EXTRA PLY TIRES on representation of a star—tires, tubes, patches, liners, etc. H. T. S. Young, Toronto, Ont.

25,670. Representation of a fish below which appear the words FISH BRAND and, above, the word TOWER'S—waterproof clothing of all kinds. Tower Canadian, Limited, Toronto, Ont.

25,680. Elliptic-shaped device containing words CANADIAN FABRIKOID, the initial and final letters of the latter word being larger than the remaining ones—artificial leather and leather substitutes. Canadian Fabrikoid, Limited, Montreal, Que.

THE UNITED KINGDOM.

388,521. The word ARIEL—garment supporters, belts, corsets, etc. Faire Bros. & Co., Limited, 2 Southampton street, and St. George's Mills, Leicester.

391,051. The word RoPaCo within a dotted circle—balata machine belting. Ropaco Supply Co., Limited, Wardleworth Mill, Yorkshire, Rochdale, Lancashire.

391,052. The word RoPaCo—asbestos goods, packing, sheeting, and belt compositions. Ropaco Supply Co., Limited, Wardleworth Mill, Yorkshire street, Rochdale, Lancashire.

392,873. Representation of a lion rampant—goods manufactured from rubber and gutta percha, not included in classes other than No. 40, namely: elastic cords and braids, and gusset, garter, frilled, plain, pocket-book, and other webs. Luke Turner & Co., Deacon street Works, Deacon street, and Grange Lane, Leicester.

392,951. Representation of a vise below the word HOLDTITE—friction tape of fabric treated with insulating medium. United States Rubber Export Co., Limited, 1790 Broadway, New York City, U. S. A. (Care of Haseltine, Lake & Co., 28 Southampton Buildings, London, W. C. 2.)

393,186. Representation of a tire bearing the word NORWALK and having within it a conventionalized letter N—tires, casings and inner tubes. The Norwalk Tire & Rubber Co., Belden Hill avenue, Wilnipark, Norwalk, Connecticut, U. S. A. (Care of Heron Rogers and Dehn, Bridge House, 181 Queen Victoria street, London, E.C.4.

393,450. The word 'Usco' within single quotation marks—boots, shoes, and slippers. United States Rubber Co., 1790 Broadway, New York City, U. S. A. (Care of Haseltine, Lake & Co., 28 Southampton Buildings, London, W.C.2.)

394,869. Representation of a mechanical device operated by ratchets—goods manufactured of rubber and gutta percha. Herbert Whitworth, Limited, Whitworth House, 115 Princess street, Manchester.

394,927. Representation of a serpent bearing the word SERPENTINE—rubber soles for footwear. George Metcalfe, Woodthorpe, Thrupp, near Stroud, Gloucestershire.

394,977. The word COBENA—goods manufactured from rubber and gutta percha, not included in classes other than No. 40. Baxendale & Co., Limited, 41 Miller street, Manchester.

395,361. The word CONDENSITE—phenol methylene compounds. Condensite Co. of America, Bloomfield, N. J., U. S. A. (Care of White, Langner, Stevens & Parry, 88-90 Chancery Lane, London, W.C.2.)

395,425. The word ACE—raincoats. Louis Bodansky & Sons, Limited, 6 Wade street, Leeds.

395,462. Representation of a label bearing a conventionalized scene of a battleship in a rain-storm at sea and the words EAUTITE and WEATHERPROOF—waterproof garments. William Merrick, "Glenfaba," Campbell Road, Worsley Road, Swinton, Manchester.

395,463. The word TURNEAU—waterproof garments. William Merrick, "Glenfaba," Campbell Road, Worsley Road, Swinton, Manchester.

396,178. The word BELDAMITE—all goods included in Class No. 47. The Beldam Packing & Rubber Co., Limited, 29 Gracechurch street, London, E. C. 3.

The London View of the 1919 Crude Rubber Market.

SUPPLY EQUALS DEMAND.

THE DISTINGUISHING FEATURE of 1919 was the enormous supply and demand for crude rubber, especially since June. The prospects are that both will be kept up through 1920 and the succeeding years. There is an increased call not for tires alone but for all rubber articles as well. The total new supply of rubber of all kinds for 1919 was about 334,000 tons, and the stocks of plantation rubber held in addition are large. The supply of Central America and other wild rubbers has been insignificant in comparison and the low grades are very hard to sell.

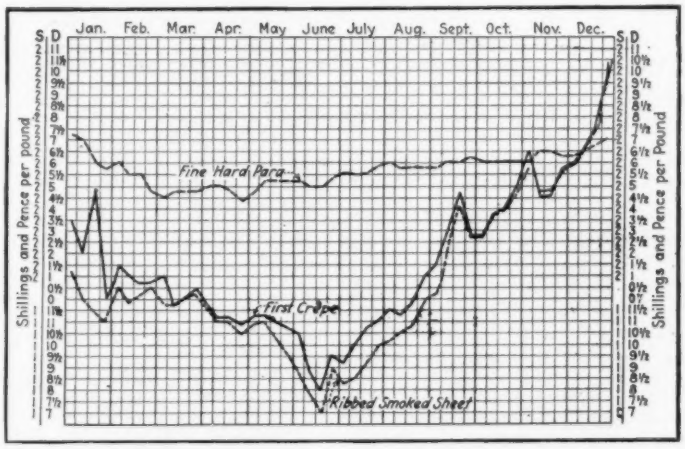
THE MARKET.

The knowledge of the large supplies of plantation rubber sent prices down to a certain degree so that in June the price of standard crepe was 1*s.* 8*d.* and of ribbed smoked sheets, 1*s.* 7*d.* There were large sales, and speculative buying helped to keep the price up and the year closed December 31 with quotations of 2*s.* 10½*d* for both fine crêpe and ribbed smoked sheets.

The large and steady supply of eastern plantation rubber naturally affects the demand for all grades of Brazilian rubber. The price for hard fine Pará was 2*s.* 7¼*d.* at the beginning of the year and 2*s* 7¼*d* on December 31, though it rose and fell slightly throughout the year.

The prices in the last three years have been as follows:

	Fine Hard Pará.	Negrohead. Scrappy.	Negrohead. Island.	Caucho Ball.
1919	2*s.* 7¼*d.*	1*s.* 7*d.*	1*s.*	1*s.* 8*d.*
1918	2*s.* 7*d.*	1*s.* 7*d.*	1*s.*	1*s.* 8*d.*
1917	2*s.* 8½*d.*	1*s.* 5*d.*	1*s.*	1*s.* 6½*d.*



LONDON SPOT FLUCTUATIONS OF FINE HARD PARÁ, FIRST CRÊPE AND RIBBED SMOKED SHEET DURING 1919.

Jelutong is worth 1*s.* 2*d.* per pound; balata 4*s.* 4*d.* for sheets and 3*s.* 4*d.* for block, while gutta percha realizes high prices.

PLANTATION RUBBER.

PREPARATION AND PACKING.

The quality of the rubber, for the most part, was very satisfactory and creditable to the managers of the plantations. Some rubber cured by the Byrne process was much liked. There was some criticism of the packing. The close press packing which makes a case hold a heavier weight of rubber is not pleasing to the European market and is said to lead to deterioration of the rubber. Bales are also objected to. The packing should be carefully done, with the rubber laid as flat as possible, especially sheets, which should not be folded and not be packed too tight. This holds particularly for the lower grades. The cases should be strong and planed; 150 pounds is a useful size.

The rubber estates in the Far East are more than satisfied with the year's results. "The power of the British Empire and its vast resources were never more manifest and convincing." The Rubber Growers' Association and the Rubber Trade Association helped the trade greatly during the year.

ACREAGE OF PLANTATION RUBBER.

The estimate of planted areas is extremely conservative, nothing being added to the acreage for 1918. It is admitted that the plantations in India and Burma have increased; but the lands where the *Castilloa* is depended upon, Mexico, the West Indies, Central and South America have not progressed, and very slight results have been obtained so far from the attempt to obtain Ceara rubber from the *Manihot* trees in East Africa. The figures for plantation rubber therefore stand:

	1917.	1918.	1919.
Ceylon ..... *acres*	290,000	300,000	300,000
Malaya, Malacca.....	780,000	800,000	800,000
Borneo	40,000	50,000	50,000
Dutch East Indies.....	650,000	700,000	700,000
India and Burma.....	50,000	55,000	55,000
Former German Colonies.....	10,000	8,000	8,000
Samoa, East and West Africa.....	.....	.....	.....
Totals.....	1,820,000	1,913,000	1,913,000

SOUTH AND CENTRAL AMERICAN RUBBER.

The shipments of South American rubber diminished during the year. While the rubber from Brazil, Bolivia and Peru was equal in quantity to that supplied in 1918, the amount of caucho was considerably less. The quantities of Ceara and Maniçoba were very small; Bolivia and Matto Grosso, Pernambuco and Assare, sent much less; Mollendo and Venezuela none. The Central American rubber was of slight importance. Mexico sent almost nothing, Columbia, Ecuador and Nicaragua very little.

The imports of medium Pará have fallen off; for certain grades there has been a fair demand, but soft, weak rubbers have been hard to sell. The following table shows the annual receipts and shipments at Pará during the past three fiscal years:

	July 1 to June 30.		
	1917.	1918.	1919.
Receipts of Pará..... *tons*	29,759	23,000	27,385
Receipts of caucho.....	9,591	8,600	6,800
Shipments to Europe.....	14,320	6,035	11,308
Shipments to the United States.....	25,950	19,350	27,250

AFRICAN RUBBER.

The quantity of African rubber on the market has fallen off decidedly. Good qualities of the West Coast varieties—Niger, Gold Coast, Accra, Cameroons and Conakry—have sold well, but imports of lump have fallen off. The French Congo and Soudan rubbers, mostly from Senegal via Bordeaux and Havre, sold well. There was a fair supply from the Belgian Congo, but it was hard to sell, except a few good qualities. From the East Coast there was little rubber; very little from the Manihot plantations of British and German East Africa, hardly any from Abyssinia, none from Nyassaland, little from Madagascar and scarcely any red rubber from Zanzibar.

EAST INDIAN RUBBER.

The lesser Asiatic districts, Rangoon, Assam and Penang, sent small quantities to England; Borneo, very little wild rubber but more *Hevea*. The supply of jelutong was small. That of balata was less than in previous years though the demand was strong.

Good qualities of gutta percha brought high prices. Sumatra and Java produced much less Rambong rubber and much of the large output of *Hevea* rubber is not counted in the British figures.

BRITISH STOCKS.

British stocks on December 31 were 24,986 tons of which 770 tons were Pará or caucho and 24,216 tons were plantation rubber. British imports and deliveries of all sorts for the year were 85,816 tons imports and 76,974 tons deliveries; of these 7,823 tons imported and 7,387 tons delivered were Pará and caucho.

THE WORLD'S PRODUCTION AND CONSUMPTION.

The world's production of crude rubber of all kinds for the year 1919 is estimated by authorities at about 334,000 tons. If 50,000 tons is added for stocks on hand and rubber afloat on January 1, 1920, it will give 384,000 tons as the world's supply, the greatest amount on record. The demand during 1919 was nearly as great.

ESTIMATED WORLD'S SUPPLY, 1919.

Plantation—Malaya, Ceylon, India and Dutch East Indies.....*tons*	292,000
Brazil and Amazonas	35,000
Matto Grosso, Manicoba, Assare	500
Central American	1,000
West Africa	5,000
East Africa	500
	334,000
Add stocks and afloat January 1, 1920	50,000
Totals	384,000

The consumption of crude rubber of all varieties and grades, but excluding reclaimed rubber, is estimated as follows for 1919:

	1917.	1918.	1919.
England .....*tons*	26,000	24,000	30,000
Germany, Austria	1,000	1,000	2,000
France	10,000	14,000	20,000
Russia	7,000	2,000	1,500
Italy, Spain, Scandinavia	5,500	5,000	7,000
Japan and Australia	5,000	5,000	7,500
The United States and Canada	155,000	187,000	230,000
Totals .....*tons*	209,500	210,000	298,000

This has been mostly consumed. Besides, there is the stock on hand in England, the East and America, say 70,000 tons and 16,000 tons afloat. This is admittedly an underestimate. Leaving out Russia and the Central Powers, where estimates are mere guesswork, the amount consumed by every country in Europe has increased, while the increase for the United States in a single year was about equal to the total normal consumption of the rest of the world.

Much of the information contained in the above review was supplied by S. Figgis & Co., London.

FEDERATED MALAY STATES RUBBER EXPORTS.

An official report from Kuala Lumpur gives the export of rubber from the Federated Malay States in the month of December as 10,340 tons, compared with 9,848 tons in November and 7,085 tons in the corresponding month of 1918. The total for the year 1919 is, therefore, 108,393 tons, as against 78,225 tons in 1918, and 79,831 tons in 1917. A better idea of the enormous strides made by the rubber industry in the Federated Malay States—the leading producer of plantation rubber—is obtained by a glance at the statistics a few years ago. So recently as 1909 the total export for the year amounted to only 2,641 tons. In 1912 it had risen to 15,506 tons, and in 1914 it amounted to 30,697 tons.

Details are appended of the monthly exports for the past three years:

	1917.	1918.	1919.
January .....*tons*	5,995	7,588	7,163
February	7,250	6,820	10,809
March	7,088	7,709	10,679
April	5,955	7,428	7,664
May	7,179	5,851	7,308
June	6,009	5,161	7,094
July	5,798	5,706	8,640
August	6,487	5,291	10,626
September	7,687	6,588	9,841
October	7,079	5,901	8,381
November	6,186	7,097	9,848
December	7,724	7,085	10,340
Totals	79,831	78,225	108,393

STRAITS SETTLEMENTS RUBBER EXPORTS.

The exports of plantation rubber from Straits Settlements ports in the month of December last (according to an official report from Singapore) amounted to 14,244 tons, compared with 13,426 tons in November and 4,839 tons in the corresponding month of 1918. Transhipments amounted to 1,853 tons in the month of December. For the past year, the total exports of rubber amounted to 145,960 tons as against 62,376 tons in 1918 and 73,092 tons in 1917. Part of last year's total was made up of rubber that had accumulated at Eastern ports owing to the lack of shipping; but there was, undoubtedly, a larger production of rubber on the Malayan estates, following upon the abolition of the voluntary restriction of output agreed upon by the principal producing companies. The above figures include transhipments of rubber from various places in the neighborhood of the Straits Settlements, such as Borneo, Java, Sumatra and the non-Federated Malay States, as well as rubber actually produced in the Colony, but do not include rubber exports from the Federated Malay States. Transhipments last year amounted to 17,903 tons.

Appended are details of the monthly exports for the past three years:

	1917.	1918.	1919.
January .....*tons*	3,562	4,302	14,404
February	6,495	2,334	15,661
March	8,299	8,858	20,908
April	6,103	6,584	10,848
May	6,282	13,587	15,845
June	8,775	6,515	5,059
July	7,351	1,978	7,818
August	3,786	1,249	8,933
September	5,679	6,209	10,476
October	4,702	3,260	8,338
November	5,555	2,661	13,426
December	6,503	4,839	14,244
Totals	73,092	62,376	145,960

EXPORTS FROM PENANG FOR THE YEAR 1919.

To Great Britain .....*piculs*[1]	232,440
Europe	.....
United States	147,987
Total	380,427

[1] One picul equals 133⅓ pounds.

EXPORTS OF INDIA RUBBER FROM MANAOS DURING THE YEAR 1919.

	NEW YORK.					EUROPE.					GRAND
EXPORTERS.	Fine.	Medium.	Coarse.	Caucho.	TOTALS.	Fine.	Medium.	Coarse.	Caucho.	TOTALS.	TOTALS.
Tancredo, Porto & Co.....*kilos*	1,167,005	216,845	569,641	600,207	2,553,698	1,106,885	182,633	34,581	32,251	1,356,350	3,910,048
J. A. Mendes & Co.	359,232	184,930	384,668	635,095	1,563,925	1,335,894	.....	8,400	.....	1,344,294	2,908,219
Stowell & Co.	739,751	230,765	234,616	378,796	1,583,928	462,227	53,582	82,289	479,387	1,077,485	2,661,413
General Rubber Co. of Brazil	1,002,565	148,813	301,123	352,499	1,805,000	493,980	53,162	29,997	28,861	606,000	2,411,000
J. G. Araujo	.....	.....	30,960	10,240	41,200	500,702	40,617	86,810	131,078	759,207	800,407
Ohliger & Co.	293,860	65,074	24,813	72,790	456,537	.....	.....	.....	.....	.....	456,537
Adelbert H. Alden, Limited	14,829	25,083	28,401	12,438	80,745	330,627	1,820	46	22,648	355,141	435,886
A. Souza	38,277	2,626	68,781	155,407	265,091	.....	.....	.....	.....	.....	265,091
Higson & Fall	2,193	170	1,069	16,484	19,916	199,971	12,864	11,280	18,990	243,105	263,021
B. Lévy & Co.	11,658	742	1,990	.....	14,390	82,584	8,417	25,335	36,669	153,005	167,395
Semper & Co.	98,984	5,170	16,010	954	121,118	1,760	1,187	719	.....	3,666	124,784
J. Essabba	42,099	6,241	1,660	.....	50,000	39,503	3,285	2,945	252	45,985	95,985
J. H. Andresen, Limited	11,749	109	249	.....	12,107	61,827	3,267	1,876	1,509	68,479	80,586
Amorim Irmãos	13,600	4,320	16,410	1,380	35,710	12,960	1,590	450	.....	15,000	50,710
Simfronio & Co.	38,747	1,687	4,136	6,884	51,454	.....	.....	.....	.....	.....	51,454
Chase Import & Export Corp.	31,461	10,394	5,612	2,800	50,267	.....	.....	.....	.....	.....	50,267
Moraes, Carneiro & Co.	23,659	1,681	5,268	1,266	31,874	.....	.....	.....	.....	.....	31,874
Paulo, Lévy & Co.	.....	.....	.....	.....	.....	14,510	2,820	4,526	10,915	31,771	31,771
C. Zencovich	.....	.....	.....	.....	.....	24,849	1,823	1,564	147	28,383	28,383
Francisco Salles Vieira	8,222	26	2,662	10,458	21,368	1,050	.....	.....	.....	1,050	22,418
Ferreira Costa & Co.	14,240	640	590	.....	15,470	.....	.....	.....	.....	.....	15,470
Various	17,866	3,806	744	.....	22,416	7,040	.....	.....	.....	7,040	29,456
	3,929,997	909,122	1,699,403	2,257,692	8,796,214	4,676,369	366,067	290,818	762,707	6,095,961	14,892,175
In transit, Iquitos	370,188	1,082,367	224,048	189,435	1,866,038	275,717	136,461	45,002	249,768	706,948	2,572,986
	4,300,185	1,991,489	1,923,451	2,447,127	10,662,252	4,952,086	502,528	335,820	1,012,475	6,802,909	17,465,161

(Compiled by Stowell & Co., Manáos, Brazil.)

UNITED STATES IMPORTS OF PLANTATION RUBBER BY PORTS—1919.

1919.	San Francisco.	Seattle.	Vancouver.	Tacoma.	Totals. Pacific Ports.	Totals. New York.
January .....*tons*	433	2,162	951	.....	3,546	1,360
February	1,188	5,256	4,690	1,289	12,423	1,656
March	7,612	5,771	389	341	14,013	9,667
April	1,997	9,117	405	.....	11,518	13,160
May	5,254	2,200	.....	.....	7,454	7,402
June	907	.....	1,491	.....	2,398	11,247
July	474	987	54	223	1,738	15,907
August	2,335	384	141	233	3,093	5,128
September	823	.....	450	.....	1,273	8,870
October	548	329	834	.....	1'711	23,772
November	678	.....	274	.....	*1,052	11,997
December	.....	.....	33	.....	*33	21,852
Totals	22,249	25,206	9,812	2,086	60,252	132,018

*Reports from Pacific ports for the months of November and December incomplete.

(Compiled by The Rubber Association of America, Inc.)

CEYLON RUBBER IMPORTS AND EXPORTS—1918-19.

IMPORTS.

	January 1 to December 31. 1918.	1919.
Crude rubber:		
From Straits Settlements.....*pounds*	2,235,585	2,755,106
India	3,242,511	1,819,584
Burma and other countries.....	3,550	3,436
Totals	5,481,646	4,578,126

EXPORTS.

Crude rubber:		
To United Kingdom.....*pounds*	19,211,002	31,481,143
United States.....	16,250,126	62,895,764
Canada and Newfoundland.....	6,032,022	863,834
Belgium	.....	51,520
France	576,505	83,400
Germany	.....	11,050
Holland	.....	13,476
Spain	.....	26
Japan	303,819	267,427
India	4,760	2,649
Straits Settlements.....	33,750	474
Africa	2,294	.....
*Victoria	641,648	98,755
*New South Wales.....	420,717	171,812
Totals	43,476,643	95,941,320

*These figures include cargoes for transhipment to New Zealand, other parts of Australia, and dependencies.

(Compiled by the Ceylon Chamber of Commerce.)

PLANTATION RUBBER EXPORTS FROM JAVA.

	October. 1918.	October. 1919.	Ten Months Ended October 31. 1918.	Ten Months Ended October 31. 1919.
To Netherlands ....*kilos*	.....	510,000	.....	2,074,000
England	.....	466,000	1,659,000	6,152,000
United States	157,000	2,223,000	5,204,000	15,633,000
Canada	.....	10,000	.....	10,000
Singapore	233,000	522,000	6,718,000	4,695,000
Japan	24,000	3,000	691,000	184,000
Australia	242,000	.....	596,000	245,000
France	.....	.....	.....	215,000
Other countries	.....	.....	.....	159,000
Totals	656,000	3,734,000	14,868,000	29,367,000
Ports of origin:				
Tandjong Priok	332,000	1,693,000	7,839,000	15,008,000
Samaran"	5,000	29,000	129,000	460,000
Soerabaya	319,000	1,874,000	6,668,000	12,746,000
Tjilatjap	.....	86,000	.....	86,000
Cheribon	.....	51,000	.....	51,000
Totals	656,000	3,733,000	14,636,000	28,351,000

	November. 1918.	November. 1919.	Eleven Months Ended November 30. 1918.	Eleven Months Ended November 30. 1919.
To Netherlands ....*kilos*	.....	620,000	.....	2,645,000
England	.....	880,000	1,659,000	7,033,000
France	.....	.....	.....	215,000
United States.....	306,000	909,000	5,510,000	16,542,000
Singapore	460,000	414,000	7,178,000	5,108,000
Japan	16,000	.....	707,000	183,000
Australia	.....	.....	596.000	245.000
Other countries.....	94,000	.....	94,000	169,000
Totals	876,000	2,823,000	15,744,000	32,140,000
Ports of origin:				
Tandjong Priok.....	491,000	1,359,000	8,331,000	16,367,000
Samarang	2,000	44,000	132,000	504,000
Soerabaya	289,000	1,414,000	6,957,000	14,161,000
Cheribon	.....	7,000	.....	7,000
Totals	782,000	2,824,000	15,420,000	31,039,000

LOWEST AND HIGHEST NEW YORK SPOT RUBBER PRICES, 1913-1919.

	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.
1913.												
First latex	103 @111	96 @103	88 @96	76 @88	78 @84	70 @77	66 @70	66 @ 70	@ 64	50 @ 52	52 @ 60	53 @ 55
Smoked sheets	109 @113	101 @110	97 @102	81 @97	81 @83	72 @83	70 @73	70 @ 72	52 @ 72	59 @ 61	59 @ 60	60 @ 66
Upriver fine	102 @110	96 @102	88 @96	77 @88	82 @91	86 @89	83 @92	83 @ 93	77 @ 88	73 @ 78	73 @ 78	71 @ 74
Upriver coarse	76 @ 84	72 @ 78	63 @ 72	52 @ 66	55 @ 61	54 @ 62	50 @ 56	50 @ 53	48 @ 52	46 @ 49	44 @ 49	44 @ 47
1914.												
First latex	55 @ 61	58 @ 64	@ 65	64 @ 72	57 @ 65	54 @ 57	54 @ 57	60 @ 105	52 @ 56	54 @ 62	58 @ 65	73 @ 87
Smoked sheets	60 @ 64	62 @ 64	@ 65	64 @ 69	57 @ 69	57 @ 63	56 @ 63	56 @ 80	63 @ 80	63 @ 66	65 @ 84	82 @ 93
Upriver fine	73 @ 77	73 @ 78	@ 74	73 @ 74	69 @ 74	68 @ 69	68 @ 73	75 @115	64 @ 78	64 @ 66	63 @ 71	70 @ 76
Upriver coarse	44 @ 47	44 @ 47	43 @ 46	43 @ 47	41 @ 46	38 @ 42	38 @ 42	43 @ 89	43 @ 55	43 @ 47	46 @ 53	51 @ 60
1915.												
First latex	59 @ 64	57 @ 63	59 @ 60	59 @ 60	59 @ 61	60 @ 63	62 @ 63	59 @ 61	57 @ 58	61 @ 63	63 @ 78	76 @ 99
Smoked sheets	65 @ 66	65 @ 66	65 @ 66	59 @ 65	59 @ 61	61 @ 63	62 @ 63	58½@ 62	58½@ 59½	59½@ 62	61½@ 75	75 @ 79
Upriver fine	61 @ 75	57 @ 61	58 @ 60	57 @ 60	59 @ 61	61 @ 63	59 @ 63	56 @ 59	55 @ 57	55 @ 57	57 @ 76	68 @ 87
Upriver coarse	45 @ 58	44 @ 48	45 @ 47	46 @ 48	45 @ 46	42 @ 47	44 @ 47	42 @ 44	41 @ 43	42 @ 47	44 @ 62	57 @ 72
1916.												
First latex	70 @103	72 @ 90	83 @ 88	74 @ 82	61 @ 74	56 @ 62	52 @ 57	53 @ 56	54 @ 60	56 @ 60	60 @ 69	68 @ 82
Smoked sheets	79 @102	75 @ 95	87 @ 93	78 @ 86½	64 @ 77½	58 @ 65½	55 @ 65	56 @ 59½	56 @ 62¾	56 @ 65	62½@ 74½	70½@ 87
Upriver fine	77 @ 99	73 @ 80	74 @ 78	72 @ 74	67 @ 72	62 @ 68	65 @ 68	65 @ 68	63½@ 74	63½@ 66½	79 @ 83	78 @ 81
Upriver coarse	60 @ 76	52 @ 60	56 @ 59	55 @ 57	50 @ 54	42 @ 50	41 @ 42	39 @ 40	41 @ 44	42 @ 46	45 @ 47	36 @ 56
1917.												
First latex	75 @ 80	75 @ 85	82 @ 90	81 @ 83	83 @ 83½	65½@ 80	65½@ 67	66 @ 67	66½@ 67½	63½@ 65½	57 @ 61	54 @ 60
Smoked sheets	75 @ 80	75 @ 75½	81 @ 90	81 @ 83	84 @ 84½	65½@ 80	65½@ 67	65 @ 67	65½@ 67	62 @ 65	56 @ 62	52 @ 61
Upriver fine	75 @ 79	77 @ 79	76½@ 80	75 @ 76	69 @ 74	68½@ 69	68½@ 69	68 @ 69	68 @ —	63½@ 66½	56 @ 63	54 @ 61
Upriver coarse	50 @ 53	50 @ 53½	52½@ 54	51 @ 51½	49 @ 53	48 @ 49	48 @ 49	48 @ 48½	46 @ 48½	43½@ 46	36 @ 41½	37 @ 41
1918.												
First latex	53 @ 58	52½@ 57	55½@ 60	59½@ 70	63 @ 68½	60 @ 63	63 @ —	63 @ —	60½@ 63	59 @ 60½	41 @ 63	54 @ 63
Smoked sheets	54 @ 57½	53 @ 57	55½@ 60	59½@ 70	62 @ 68½	62 @ —	62 @ —	62 @ —	59½@ 62	58 @ 59½	40 @ 61¼	52 @ 61¼
Upriver fine	57 @ 61	56 @ 58	56 @ 60½	60 @ 70	68 @ —	68 @ —	68 @ —	68 @ —	68 @ —	63 @ 68	57½@ 68	61 @ 68
Upriver coarse	37 @ 41	35½@ 37½	33½@ 34½	34 @ 38½	38 @ 42	40 @ —	40 @ —	40 @ —	40 @ —	35 @ 40	31 @ 40	36 @ 40
1919.												
First latex	52 @ 58	56 @ 58	51 @ 56	47 @ 50½	45½@ 48	40 @ 45	39½@ 42½	41¾@ 45½	45½@ 52½	49½@ 55	53 @ 54½	51 @ 54¾
Smoked sheets	51 @ 56	54 @ 57	50 @ 54½	46½@ 49½	44½@ 47	39 @ 44	38½@ 41½	39¾@ 44½	44½@ 51½	48½@ 54	52 @ 54	51 @ 54½
Upriver fine	58½@ 61	58½@ 59½	55½@ 58½	56 @ —	56 @ 56¾	55½@ 56¾	55 @ 55½	54 @ 55	54½@ 56	52 @ 55	49¾@ 52	47 @ 49
Upriver coarse	34 @ 36	34 @ 35	34 @ 35	34 @ —	32½@ 34¾	32 @ 33	32 @ 33	31½@ 32	32 @ 33½	33 @ 35	34½@ 35	35 @ —

Review of the Crude Rubber Market.

NEW YORK.

THE CRUDE RUBBER MARKET remained steady through February, declining gradually to the close. There was little buying by manufacturers, but good trading among the dealers. Plantation rubber continues to command higher prices than the Brazilian. The markets in London and Singapore are dull, all trading being affected by the uncertainty in exchange, especially the dealing in futures.

Prices for plantation and South American rubber at the beginning and toward the end of the month are shown in the following quotations:

PLANTATIONS. February 2, first latex crêpe, spot 51 cents; futures, April-June, 52 cents; July-December, 53 cents; February 25, spot, 46-47 cents; futures, April-June 47½, July-December 49½ cents.

February 2, ribbed smoked sheets, spot 51 cents; futures, April-June. 52 cents; July-December, 53 cents; February 25, spot, 46½ cents; futures, April-June 47, July-December 49-49½ cents.

February 2, No. 1 amber crêpe, spot, 52 cents; February 25, 48 cents; futures, July-December 49 cents.

February 2, clean thin brown crepe, spot, 48½ cents; futures, 49 cents; February 25, spot, 45 cents; futures, July-December 47½@48 cents.

February 2, No. 1 roll brown crêpe, spot and futures, 42 cents; February 25, spot, 41 cents; futures, July-December 40-41 cents.

SOUTH AMERICAN PARÁS AND CAUCHO. February 2, spot prices; upriver fine 45 cents, islands fine 44 cents, upriver coarse 34 cents, islands coarse 23 cents, Cametá coarse 23 cents, caucho ball 34 cents. February 25, upriver fine 42½ cents, islands fine 42 cents, upriver coarse 31½ cents, islands coarse 20½ cents, Cametá coarse 21½ cents, caucho ball 32 cents.

NEW YORK QUOTATIONS.

Following are the New York spot quotations, for one year ago, one month ago and on February 25, the current date:

	March 1, 1919.	February 2, 1920.	February 25, 1920.
PLANTATION HEVEA—			
First latex crêpe	$0.56 @	$0.52½ @	$0.46 @.47
Amber crêpe No. 1	.50 @	.52 @	.48 @
Amber crêpe No. 2	.49 @	.51 @	.47 @
Amber crêpe No. 3	.48 @	.50 @	.46 @
Amber crêpe No. 4	.46 @	.48 @	.45 @
Brown crêpe, thick and thin clean	.47 @	.48 @	.45 @
Brown crêpe, thin specky	.45 @	.46 @	.42 @
Brown crêpe, rolled	.37 @	.42 @	.41 @
Smoked sheet, ribbed, standard quality	.55 @	.52 @	.46½ @.47
Smoked sheets, plain, standard quality	.54 @	.51 @	.41 @
Unsmoked sheet, standard quality	.54 @	.48 @	@
Colombo scrap No. 1	.39 @	.37 @	@
Colombo scrap No. 2	.37 @	.35 @	@
EAST INDIAN—			
Assam crêpe	.36 @	.46 @ .47	@
Assam onions	.44 @	.46 @ .48	@
Penang block scrap	.48 @	.38 @	@
PONTIANAK—			
Banjermassin	.13½ @	.13 @	.13 @
Palembang	.16 @	@	@
Pressed block	.19 @	.27 @	.27 @
Sarawak	.12 @	.11 @	@
SOUTH AMERICAN—			
PARAS—			
Upriver fine	.58½ @	.47 @	.42½ @
Upriver medium	.53 @	.39 @	@
Upriver coarse	.34 @	.34 @	.31½ @
Upriver weak, fine	.45 @	.37 @	@
Islands, fine	.49 @	.45 @	.42 @
Islands, medium	.44 @	.45 @	@
Islands, coarse	.22 @	.22 @	.20½ @
Cametá, coarse	.22 @	.23 @	.21½ @
Madeira, fine	@	.47 @	@
Acre Bolivian, fine	@	.47 @	@
Peruvian fine	.56 @	.47 @	@
Tapajos fine	.55 @	.46 @	@
CAUCHO—			
Lower caucho ball	.32 @	.30 @	.32 @
Upper caucho ball	.34 @	.34 @	@
SOUTH AMERICAN—			
MANICOBAS—			
Ceara negro heads	.35 @	.35 @	.36 @
Ceara scrap	.32 @	.32 @	.30 @
Manicoba, 30% guarantee	.40 @ .41	.26 @	.32 @
Mangabeira thin sheet	.37 @ .38	.35 @	.30 @
CENTRALS—			
Corinto scrap	.36 @ .37	.33 @	.29 @.32
Esmeralda sausage	@	.33 @	.29 @.32
Central scrap	@	.32 @	.29 @.32
Central scrap and strip	@	.30 @ .31½	.27 @.30
Central wet sheet	@	.23 @	.21 @.24
Guayule, 20% guarantee	.33 @ .34	.27 @	.27 @
Guayule, washed and dried	@	.37 @	.38 @
AFRICANS—			
Niger flake, prime	.24 @	.18 @	.17 @
Benguela, extra No. 1, 28%	@	.27 @	@
Benguela, No. 2, 32½%	@	@	@
Congo prime, black upper	.45 @	.39 @	.38 @
Congo prime, red upper	@	.37 @	.35 @
Kassai black	@	.40 @	.39 @
Kassai red	@	.36 @	@
Rio Nunez ball			
Rio Nunez sheets and strings	@	.40 @	.37 @
Conakry niggers	@	.40 @	.36 @
Massai sheets and strings	@	.40 @	@
GUTTA PERCHA—			
Gutta Siak	@	.26 @	.30½ @.32
Red Macassar	@	2.90 @	2.65 @
BALATA—			
Block, Ciudad Bolivar	.71 @ .72	.56 @	.50 @.53
Colombia	@	.50 @	.46 @.50
Panama	@	.46 @	.32 @.45
Surinam sheet	.88 @ .89	.82 @	.73 @.76
amber	@	.84 @	.74 @.78

RECLAIMED RUBBER.

The market for reclaimed rubber during February has been active in all the standard grades. Production is practically sold up into the spring months by the leading reclaimers who are not seeking contracts from users at the present time. On the other hand, large consumers are holding back on the present market beyond their commitments for May in anticipation of a hoped for change of prices within a few weeks.

The prices on all standard grades remain the same as the quotations for January.

NEW YORK QUOTATIONS.

February 25, 1920.

Prices subject to change without notice.

Standard reclaims:	
Floating	$0.30 @$0.35
Friction	.35 @ .40
Mechanical	.12½ @ .13½
Red	.23 @ .24
Shoe	.16 @ .16½
Tires, auto	.16 @ .17
truck	.13 @ .14
White	.22 @ .25

COMPARATIVE HIGH AND LOW SPOT RUBBER PRICES.

	February. 1920.*		1919.		Allocated and Free. 1918.	
PLANTATIONS:						
First latex crêpe	$0.51½ @	$0.46¼	$0.58 @	$0.55½	$0.53½ @	$0.51½
Smoked sheet ribbed	.51½ @	.46	.57½ @	.54	.52 @	.49½
PARAS:						
Upriver, fine	.46 @	42½	.59½ @	.58½	.58½ @	.56
Upriver, coarse	.34 @	.31½	.35 @	34	.37½ @	.35
Islands, fine	.44¾ @	.42	.49½ @	.49	.48 @	.47
Islands, coarse	.21 @	.20½	.22¾ @	.22½	.35 @	.24
Cametá	.23½ @	.21½	.23 @		.35 @	.24

*Figured only to February 25, 1920.

THE MARKET FOR COMMERCIAL PAPER.

In regard to the financial situation, Albert B. Beers, broker in crude rubber and commercial paper, No. 68 William street, New York City, advises as follows:

"During February there has been a fair demand for paper, mostly from out-of-town banks, and early in the month rates were about 6½ per cent for the best rubber names, but at the end of the month buyers wanted 6¾ per cent and 7 per cent on almost everything. It looks as though rates will rule very firm for some time yet."

SINGAPORE RUBBER REPORT.

GUTHRIE & CO., LIMITED, Singapore, report [January 8, 1920]:

At the usual weekly auctions held yesterday and to-day there was a good demand for all grades, with the exception of off qualities ribbed smoked sheet. Fine pale crêpe sold at up to $1.12 (one lot sold for $1.13 and two lots for $1.12½) or 2 cents better than last week. Ribbed smoked sheet fetched $1.11½ (three lots sold at $1.12) or the same as last auction.

Last week's good demand for the lower grades of crêpe continued, and these show advances of from 3 to 3½ cents.

Out of 871 tons catalogd 616 tons were offered and 348 tons sold, many lots of off quality ribbed smoked sheet being withdrawn.

The following is the course of values:

	In Singapore, per Pound.[1]		Sterling Equivalent per Pound in London.		
Sheet, fine ribbed smoked.....	108c	@ 111½c	2/ 8¾	@	2/ 9¾
Sheet, good ribbed smoked....	98	@ 107½	2/ 6	@	2/ 8⅝
Crêpe, fine pale	108½	@ 112	2/ 9¼	@	2/10⅛
Crêpe, good pale	101	@ 107½	2/ 7½	@	2/ 9⅛
Crêpe, fine brown	95½	@ 103	2/ 5¾	@	2/ 7⅝
Crêpe, good brown	88	@ 96	2/ 3⅛	@	2/ 5⅛
Crêpe, dark brown	80	@ 90	2/ 1⅜	@	2/ 4⅛
Crêpe, bark brown	74½	@ 84½	1/11¾	@	2/ 2⅝

[1]Quoted in Straits Settlements currency—$1 = $0.567 United States currency.

BATAVIA RUBBER MARKET.

HERMANS, MARSMAN & CO., Batavia report [November 16 to December 15, 1919]:

At the opening of the market, the tone was very weak, and during the first week of December did not improve; only a few transactions were made, at prices ranging between 1.31-1.42 guilders for fine pale crêpe and prime smoked sheets.

The market closed with more demand and higher quotations. 1.44 guilders (57.6 cents) for prime smoked sheetts and fine pale crêpe, while some mixed lots consisting of off crêpe and off sheets were sold at 1.27 guilders (50.8 cents).

AMSTERDAM MARKET REPORT.

JOOSTEN & JANSSEN, Amsterdam, report [January 30, 1920]:

During the present week the market was very firm, a good turn-over being done with rising prices.

At the beginning of the week a fair business was done for deliveries during the present year, mostly for the later months, at f. 1.40½-1.41½, but later on inquiry was mostly confined to spot parcels, for which, in consequence of coverings for January delivery, very good prices were obtained.

On Monday business in standard crêpe was done at f. 1.42, on Tuesday in the inscription f. 1.45-f. 1.47½ was paid, and later in the week even f. 1.50.

During the last days only a little was being offered, but on the other hand the most pressing needs of the moment seem to have been satisfied.

On February 10 277,200 kgs. are being offered in the next inscription, of which about 58,000 kgs. are standard smoked sheets, 112,000 kgs. standard crêpe, and about 100,000 kgs. lower qualities.

ANTWERP RUBBER MARKET.

GRISER & CO., Antwerp, report [January 30, 1920]:

There have been no serious fluctuations of late, the market is sound and was firm at the end of the month. Sales are of little importance, as dealers here are waiting for the auction on February 19. The stock on hand at the port of Antwerp was about 886 tons. The closing prices for futures on January 30 were 14.05 francs for every month from February to October, 14.00 francs November, 13.85 francs December. The tone of the market is firm.

UNITED STATES CRUDE RUBBER IMPORTS FOR 1920 (BY MONTHS).

1919.	Plantations.	Paras.	Africans.	Centrals.	Guayule.	Manicoba and Matto Grosso.	Total for 1920.	Total for 1919.
January ....tons	17,799	2,620	821	111	...	...	21,351	7,235

(Compiled by The Rubber Association of America, Inc.)

CRUDE RUBBER ARRIVALS AT ATLANTIC AND PACIFIC PORTS AS STATED BY SHIPS' MANIFESTS.

PARAS AND CAUCHO AT NEW YORK.

	Fine.	Medium.	Coarse.	Caucho.	Mixed.	Totals. Pounds.
JANUARY 28. By the S. S. *Manco*, from Pará and Manáos.						
G. Amsinck & Co., Inc....	19,992	.....	.....	.....	.....	19,992
Poel & Kelly.....	105,938	.....	.....	.....	.....	105,938
Cowdrey & Co.....	13,500	.....	.....	.....	.....	13,500
W. R. Grace & Co.....	1,960	.....	.....	.....	.....	1,960
Meyer & Brown, Inc.....	89,600	.....	.....	.....	.....	89,600
Hagemeyer & Brunn.....	112,000	.....	.....	.....	.....	112,000
H. A. Astlett & Co.....	18,700	.....	.....	19,040	54,700	92,440
Aldens' Successors, Inc....	1,312	.....	.....	6,897	2,068	10,277
Paul Bertuch	12,625	11,055	.....	30,938	.....	54,618
FEBRUARY 12. By the S. S. *Rembrandt*, at New York.						
H. A. Astlett & Co.....	51,349	.....	.....	37,558	15,680	104,587
JANUARY 9. By the S. S. *Euclid*, at New York.						
Hagemeyer & Brunn.....	33,600	.....	.....	112,000	.....	145,600
H. A. Astlett & Co.....	73,100	.....	.....	27,430	1,580	102,110
Paul Bertuch	64,839	30,938	.....	.....	.....	95,777
FEBRUARY 13. By the S. S. *City of Newcastle*, at New York.*						
Poel & Kelly.....	.....	.....	.....	.....	.....	677,670
Thos. A. Desmond & Co..	.....	.....	.....	.....	.....	39,200
William H. Stiles & Co...	.....	.....	.....	.....	.....	70,070
Chas. T. Wilson & Co., Inc.	.....	.....	.....	.....	.....	38,220
Rubber Trading Co.....	.....	.....	.....	.....	.....	176,304
L. Littlejohn & Co., Inc..	.....	.....	.....	.....	.....	333,886
F. R. Henderson & Co....	.....	.....	.....	.....	.....	257,348
Raw Products Co.....	.....	.....	.....	.....	.....	32,928
Adolph Hirsch & Co.....	.....	.....	.....	.....	.....	14,994
A. C. Fox & Co.....	.....	.....	.....	.....	.....	22,050
Edward Maurer Co., Inc..	.....	.....	.....	.....	.....	80,850
J. T. Johnstone & Co., Inc.	.....	.....	.....	.....	.....	150,430
FEBRUARY 24. By the S. S. *Korimoen*, at New York.						
United Malaysian Rubber Co., Limited	.....	.....	.....	.....	1,210	1,210

*Details not available.

PLANTATIONS.

(Figured 180 pounds to the bale, or case.)

	Shipment from:	Shipped to:	Pounds.	Totals.
JANUARY 25. By the S. S. *Fluor Spar*, at New York.				
Meyer & Brown, Inc...	Colombo	New York	378,560	
Hadden & Co.....	Colombo	New York	4,000	382,560
JANUARY 28. By the S. S. *Rotterdam*, at New York.				
Meyer & Brown, Inc...	Rotterdam	New York	132,160	
Aldens' Successors, Inc.	Rotterdam	New York	288,177	420,337
JANUARY 28. By the S. S. *Vistalia*, at New York.				
Arthur Meyer & Co., Ltd.	London	New York	30,420	
L. Sutro & Co.....	London	New York	135,000	
Meye r& Brown, Inc...	London	New York	112,000	
Various	London	New York	989,780	1,267,200
JANUARY 28. By the S. S. *Mauretania*, at New York.				
Various	Southampton	New York	5,940	5,940
JANUARY 30. By the S. S. *Valdura*, at New York.				
William H. Stiles & Co.	London	New York	11,200	11,200
FEBRUARY 1. By the S. S. *West Mohno*, at New York.				
Chas. T. Wilson & Co., Inc.	Liverpool	New York	35,280	
Various	Liverpool	New York	7,020	42,300
FEBRUARY 2. By the S. S. *Sydic*, at New York.				
L. Littlejohn & Co., Inc.	Colombo	New York	80,640	
Chas. T. Wilson & Co., Inc.	Colombo	New York	186,660	
Weise & Co.....	Colombo	New York	21,780	
C. C. Trevanion & Co..	Colombo	New York	123,300	
Winter, Ross & Co.....	Colombo	New York	33,480	
H. Ickleheimer.....	Colombo	New York	55,080	
Meyer & Brown, Inc...	Colombo	New York	235,200	
Various	Colombo	New York	909,900	1,646,040
FEBRUARY 2. By the S. S. *Arabia Maru*, at Seattle.				
Firestone Tire & Rubber Co.	Singapore	Akron	845,100	
Chas. T. Wilson & Co., Inc.	Singapore	New York	435,600	
F. R. Henderson & Co..	Singapore	Seattle	25,020	
F. R. Henderson & Co..	Singapore	New York	14,940	
Aldens' Successors, Inc.	Singapore	New York	50,940	1,371,680
FEBRUARY 2. By the S. S. *Methuen*, at New York.				
The Goodyear Tire & Rubber Co.	Singapore	Akron	86,400	
L. Littlejohn & Co., Inc..	P. Swettenham.	New York	28,800	
Firestone Tire & Rubber Co.	Singapore	Akron	504,000	
F. R. Henderson & Co..	Singapore	New York	6,320	
General Rubber Co.....	Singapore	New York	1,493,820	
Meyer & Brown, Inc...	Singapore	New York	112,000	2,231,340
FEBRUARY 2. By the S. S. *Mexico Maru*, at Seattle, via Yokohama.				
Fred Stern & Co.....	Singapore	New York	28,800	
J. T. Johnstone & Co., Inc.	Singapore	New York	33,600	
Firestone Tire & Rubber Co.	Singapore	Akron	587,320	
United Malaysian Rubber Co., Ltd.	Singapore	New York	20,160	
F. R. Henderson & Co..	Singapore	Seattle	414,120	
Latham & Co.....	Singapore	Seattle	237,600	
Various	Singapore	Seattle	960	1,322,560
FEBRUARY 2. By the S. S. *Minnekahda*, at New York.				
General Rubber Co.....	London	New York	135,180	
The Goodyear Tire and Rubber Co.	London	Akron	137,880	
Konig Bros. & Co.....	London	New York	464,040	
Baring Bros.	London	New York	21,060	
Fred Stern & Co.....	London	New York	380,340	
Aldens' Successors, Inc.	London	New York	58,680	
Various	London	New York	339,380	1,535,560
FEBRUARY 4. By the S. S. *Irishman*, at New York.				
The B. F. Goodrich Co.	London	Akron	422,820	
Fred Stern & Co.....	London	New York	83,340	
Thornett & Fehr.....	London	New York	1,800	
General Rubber Co.....	London	New York	633,240	
Konig Bros. & Co.....	London	New York	291,960	
R. F. Downing & Co...	London	New York	169,740	
Aldens' Successors, Inc.	London	New York	1,585,439	
Various	London	New York	1,049,221	4,237,560
FEBRUARY 5. By the S. S. *Arabia Maru*, at New York.				
Aldens' Successors, Inc.	Yokohama	New York	56,560	56,560
FEBRUARY 9. By the S. S. *Eurymedon*, at New York.				
William H. Stiles & Co..	Singapore	New York	89,600	
Aldens' Successors, Inc.	Singapore	New York	30,078	119,678

	Shipment from:	Shipped to:	Pounds.	Totals.
FEBRUARY 9. By the S. S. *Rimouski*, at New York.				
Baring Bros.	Liverpool	New York	10,950	
Earle Bros.	Liverpool	New York	1,800	
Goldman, Sachs & Co.	Liverpool	New York	14,100	
Konig Bros. & Co.	Liverpool	New York	35,250	
Balfour, Williamson & Co.	Liverpool	New York	7,950	
Various	Liverpool	New York	70,800	140,850
FEBRUARY 9. By the S. S. *Empress of Asia*, at New York.				
Edward Boustead & Co.	Penang	Akron	84,800	84,800
FEBRUARY 9. By the S. S. *City of Orah*, at New York.				
Various	Colombo	New York	180,360	180,360
FEBRUARY 9. By the S. S. *Maneric*, at New York.				
L. Littlejohn & Co., Inc.	Singapore	New York	803,800	
Gaston, Williams & Wigmore	Singapore	New York	18,360	
Edward Maurer Co., Inc.	Singapore	New York	40,500	
W. T. Sargent & Sons.	Singapore	New York	53,100	
Adolph Hirsch & Co.	Singapore	New York	27,540	
Everett Heaney & Co.	Singapore	New York	48,060	
The Fisk Rubber Co.	Singapore	New York	171,720	
Chas. T. Wilson & Co., Inc.	Singapore	New York	118,260	
F. R. Henderson & Co.	Singapore	New York	962,560	
Thornett & Fehr, Inc.	Singapore	New York	158,220	
American Trading Co.	Singapore	New York	28,800	
A. G. De Sherbinin & Co.	Singapore	New York	80,280	
J. T. Johnstone & Co., Inc.	Singapore	New York	188,640	
Mitsui & Co., Limited.	Singapore	New York	90,720	
Hadden & Co.	Singapore	New York	345,600	
Rubber Importers' & Dealers' Co., Inc.	Singapore	New York	586,260	
Hood Rubber Co.	Singapore	Watertown	216,000	
Williams Shipping Agency	Singapore	New York	869,040	
Poel & Kelly.	Singapore	New York	278,460	
Balfour, Williamson & Co.	Singapore	New York	47,960	
William H. Stiles & Co.	Singapore	New York	130,100	
Meyer & Brown, Inc.	Singapore	New York	539,840	
Pell & Dumont, Inc.	Singapore	New York	52,020	
Fred Stern & Co.	Singapore	New York	84,060	
Thos. A. Desmond & Co.	Singapore	New York	101,340	6,041,240
FEBRUARY 12. By the S. S. *Monteagle*, at New York.				
United States Rubber Co.	Hongkong	New York	357,300	357,300
FEBRUARY 13. By the S. S. *Belgic*, at New York.				
Aldens' Successors, Inc.	Liverpool	New York	44,460	
Baring Bros.	Liverpool	New York	4,860	49,320
FEBRUARY 13. By the S. S. *City of New Castle*, at New York.				
F. R. Henderson & Co.	Singapore	New York	383,040	
Fred Stern & Co.	Singapore	New York	493,380	
L. Littlejohn & Co., Inc.	Singapore	New York	994,860	
Chas. T. Wilson Co., Inc.	Singapore	New York	93,500	
Pacific Trading Corp. of America	Singapore	New York	91,620	
United Malaysian Rubber Co., Ltd.	Singapore	New York	10,260	
The Fisk Rubber Co.	Singapore	Chicopee Falls	341,820	
Robinson & Co.	Singapore	New York	86,760	
Rogers-Pyatt Shellac Co.	Singapore	New York	158,400	
Poel & Kelly.	Singapore	New York	358,380	
J. T. Johnstone & Co., Inc.	Singapore	New York	30,240	
Balfour, Williamson & Co.	Singapore	New York	50,400	
Pell & Dumont, Inc.	Singapore	New York	20,160	
United States Rubber Co.	Singapore	New York	930,780	
Rubber Importers' & Dealers' Co., Inc.	Singapore	New York	468,180	
Smith & Schippers.	Singapore	New York	3,600	
Aldens' Successors, Inc.	Singapore	New York	480,396	
Rubber Trading Co.	Singapore	New York	85,500	
Meyer & Brown, Inc.	Singapore	New York	22,400	
Edward Maurer Co., Inc.	Singapore	New York	72,180	
Thos. A. Desmond & Co.	Singapore	New York	254,160	
The Goodyear Tire & Rubber Co.	Singapore	Akron	158,580	
Hadden & Co.	Singapore	New York	292,320	
Boston Insulated Wire & Cable Co.	Singapore	Dorchester	5,400	
American Trading Co.	Singapore	New York	93,240	
A. G. De Sherbinin & Co.	Singapore	New York	125,280	
William H. Stiles & Co.	Singapore	New York	268,800	
F. Bossevain & Co.	Singapore	New York	54,360	
Goldman, Sachs & Co.	Singapore	New York	42,480	
N. W. Obalski & Co., Inc.	Singapore	New York	30,360	
The B. F. Goodrich Co.	Singapore	Akron	585,900	
Swinehart Tire & Rubber Co.	Singapore	Akron	52,920	
Pennsylvania Rubber Co.	Singapore	New York	40,320	
Hood Rubber Co.	Singapore	Watertown	27,000	
Thornett & Fehr, Inc.	Deli	New York	12,960	
Edward Maurer Co., Inc.	Deli	New York	18,000	
Poel & Kelly.	Deli	New York	23,040	
J. T. Johnstone & Co., Inc.	Deli	New York	109,260	
American Metal Co.	Deli	New York	58,680	
Mitsui & Co., Limited.	Deli	New York	44,640	
F. R. Henderson & Co.	Deli	New York	44,820	
Harrisons & Crosfield, Limited	Deli	New York	102,960	
Various	Singapore	New York	793,080	
Various	Malacca	New York	3,960	8,427,376

	Shipment from:	Shipped to:	Pounds.	Totals.
FEBRUARY 16. By the S. S. *Kabinga*, at New York.				
The Goodyear Tire & Rubber Co.	Colombo	Akron	424,080	
Chas. T. Wilson, Inc.	Colombo	New York	381,240	
Aldens' Successors, Inc.	Colombo	New York	11,200	
Various	Colombo	New York	453,780	
Harrisons & Crosfield, Limited	Cochin	New York	216,720	
Various	Cochin	New York	63,180	1,550,200
FEBRUARY 16. By the S. S. *New Amsterdam*, at New York.				
Poel & Kelly.	Rotterdam	New York	134,100	
Pablo Calvet & Co.	Rotterdam	New York	540,000	
Weise & Co.	Rotterdam	New York	298,980	
Meyer & Brown, Inc.	Rotterdam	New York	67,200	
Aldens' Successors, Inc.	Rotterdam	New York	129,582	1,169,862
FEBRUARY 17. By the S. S. *Port Lyttleton*, at New York.				
Aldens' Successors, Inc.	Liverpool	New York	1,223,809	
General Rubber Co.	Liverpool	New York	635,580	
Adolph Hirsch & Co.	Liverpool	New York	309,420	
Meyer & Brown, Inc.	Liverpool	New York	112,000	
Various	.....	.....	1,136,480	3,417,289
FEBRUARY 18. By the S. S. *Kiyo Maru*, at San Francisco.				
Firestone Tire & Rubber Co.	Singapore	Akron	393,460	393,460
FEBRUARY 19. By the S. S. *Michigan*, at New York.				
Fred Stern & Co.	London	New York	17,280	
Balfour, Williamson & Co.	London	New York	20,700	
Various	London	New York	360	38,340
FEBRUARY 20. By the S. S. *Empress of Japan*, at Vancouver.				
Meyer & Brown, Inc.	Singapore	Vancouver	100,800	100,800
FEBRUARY 20. By the S. S. *Valacia*, at New York.				
Poel & Kelly.	London	New York	386,460	
Various	London	New York	390,900	777,360
FEBRUARY 24. By the S. S. *Valdura*, at New York.				
Various	London	New York	100,440	100,440
FEBRUARY 24. By the S. S. *East India*, at New York.				
R. F. Downing & Co.	London	New York	186,360	
Mitsui & Co., Limited.	London	New York	192,600	
W. R. Grace & Co.	London	New York	10,980	
Thornett & Fehr, Inc.	London	New York	360	390,240
FEBRUARY 20. By the S. S. *Slavic Prince*, at New York.				
William H. Stiles & Co.	Singapore	New York	156,800	
Aldens' Successors, Inc.	Singapore	New York	22,400	
Edward Maurer Co., Inc.	Singapore	New York	59,080	
Gaston, Williams & Wigmore	Singapore	New York	64,080	
L. Littlejohn & Co., Inc.	Singapore	New York	568,080	
Fred Stern & Co.	Singapore	New York	1,124,640	
Balfour, Williamson & Co.	Singapore	New York	431,460	
F. R. Henderson & Co.	Singapore	New York	151,740	
Robinson & Co.	Singapore	New York	28,200	
Poel & Kelly.	Singapore	New York	806,220	
Edward Bousted & Co.	Singapore	New York	73,000	
The Fisk Rubber Co.	Singapore	Chicopee Falls	82,800	
Chas. T. Wilson Co., Inc.	Singapore	New York	98,100	
Hadden & Co.	Singapore	New York	184,320	
East Asiatic Co., Inc.	Singapore	New York	144,900	
Rogers-Pyatt Shellac Co.	Singapore	New York	181,800	
J. T. Johnstone & Co., Inc.	Singapore	New York	72,360	
Rubber Trading Co.	Singapore	New York	48,960	
Thos. A. Desmond & Co.	Singapore	New York	151,380	
Rubber Importers' & Dealers' Co., Inc.	Singapore	New York	273,780	
Thornett & Fehr, Inc.	Singapore	New York	70,560	
Hood Rubber Co.	Singapore	Watertown	5,400	
Pacific Trading Corp. of America	Penang	New York	112,500	
W. R. Grace & Co.	Penang	New York	11,160	
Various	Singapore	New York	846,900	
Various	Penang	New York	180,720	5,951,340
FEBRUARY 24. By the S. S. *Karimoen*, at New York.				
General Rubber Co.	T'jong Priok	New York	636,660	
The Fisk Rubber Co.	T'jong Priok	Chicopee Falls	299,700	
Poel & Kelly.	T'jong Priok	New York	42,480	
L. Sutro & Co.	T'jong Priok	New York	75,060	
Harrisons & Crosfield, Limited	T'jong Priok	New York	71,000	
L. Littlejohn & Co., Inc.	T'jong Priok	New York	54,360	
Thornett & Fehr, Inc.	T'jong Priok	New York	9,900	
Rubber Trading Co.	T'jong Priok	New York	108,000	
Vernon Metal & Produce Co.	T'jong Priok	New York	12,060	
Fred Stern & Co.	T'jong Priok	New York	89,820	
F. R. Henderson & Co.	T'jong Priok	New York	45,000	
Fred Stern & Co.	Batavia	New York	26,640	
Kuanrah Trading Co., Ltd.	Batavia	New York	93,780	
Manhattan Rubber Mfg. Co.	Batavia	New York	28,800	
F. R. Henderson & Co.	Batavia	New York	393,480	
F. R. Henderson & Co.	Soerabaya	New York	1,800	
L. Littlejohn & Co., Inc.	Soerabaya	New York	346,680	
Edward Maurer Co., Inc.	Soerabaya	New York	37,260	
Gaston, Williams & Wigmore	Soerabaya	New York	127,440	
Mitsui & Co., Limited.	Soerabaya	New York	137,340	
General Rubber Co.	Soerabaya	New York	3,600	
United Malaysian Rubber Co., Ltd.	Soerabaya	New York	3,467	
Various	Penang	New York	26,100	2,670,427

AFRICANS.

	Shipment from:	Shipped to:	Pounds.	Totals.
JANUARY 28. By the S. S. *Eglantier*, at New York.				
Various	Paris	New York	40,150	40,150
FEBRUARY 2. By the S. S. *Manchuria*, at New York.				
Various	Antwerp	New York	5,750	5,750
FEBRUARY 3. By the S. S. *Roma*, at New York.				
Thornett & Fehr, Inc...	Marseilles	New York	39,817	
Various	Marseilles	New York	10,925	50,742
FEBRUARY 9. By the S. S. *Mormugao*, at New York.				
Various	Lisbon	New York	223,097	223,097
FEBRUARY 9. By the S. S. *Lebanon*, at New York.				
Various	Bordeaux	New York	318,520	318,520
FEBRUARY 15. By the S. S. *Victorious*, at New York.				
Albert Eyck & Co	Antwerp	New York	230	
Poel & Kelly	Antwerp	New York	115	345
FEBRUARY 19. By the S. S. *Lapland*, at New York.				
Various	Antwerp	New York	372,385	372,385
FEBRUARY 20. By the S. S. *Britannia*, at New York.				
Various	Marseilles	New York	1,100,580	1,100,580
FEBRUARY 21. By the S. S. *Henry Clay*, at New York.				
Rubber Importers' & Dealers' Co., Inc	Antwerp	New York	150	150
FEBRUARY 21. By the S. S. *Jacques Cartier*, at New York.				
Poel & Kelly	Havre	New York	69,460	69,460

BALATA.

JANUARY 28. By the S. S. *Manco*, at New York.				
Cowdry & Co	Brazil	New York	4,950	4,950
FEBRUARY 1. By the S. S. *West Mohno*, at New York.				
Various	Liverpool	New York	1,500	1,500
FEBRUARY 2. By the S. S. *Mayaro*, at New York.				
American Trading Co...	Trinidad	New York	1,500	
Southern Sales Corp....	Trinidad	New York	112,200	
Various	Trinidad	New York	4,675	118,375
FEBRUARY 4. By the S. S. *Iriskman*, at New York.				
Earle Bros.	London	New York	3,300	3,300
FEBRUARY 7. By the S. S. *Oranje Nassau*, at New York.				
Wm. Schall & Co	Paramaribo	New York	4,398	4,398
FEBRUARY 11. By the S. S. *Ancon*, at New York.				
J. S. Sembrada & Co....	Cristobal	New York	900	
Hollingshurst & Co	Cristobal	New York	2,700	
H. Marquardt & Co	Cristobal	New York	1,650	5,250
FEBRUARY 16. By the S. S. *Wm. M. Tupper*, at New York.				
E. Wyucta & Co	Puerto C'mbia	New York	3,200	3,200
FEBRUARY 16. By the S. S. *Maravel*, at New York.				
G. Amsinck & Co., Inc..	Trinidad	New York	12,120	
General Export & Commission Co.	Trinidad	New York	11,160	
Southern Sales Corp....	Trinidad	New York	43,200	
South & Central American Commercial Co...	Trinidad	New York	22,760	
Various	Trinidad	New York	2,880	92,120
FEBRUARY 16. By the S. S. *Panama*, at New York.				
Heilbron, Wolff & Co..	Cristobal	New York	4,200	
G. Amsinck & Co., Inc..	Cristobal	New York	2,700	
Ultramares Corp.	Cristobal	New York	7,200	
American Trading Co...	Cristobal	New York	150	
Merck & Co	Cristobal	New York	4,140	
J. S. Sembrada & Co...	Cristobal	New York	8,460	26,850
FEBRUARY 20. By the S. S. *Carillo*, at New York.				
Various	Cristobal	New York	900	900

CENTRALS.

JANUARY 30. By the S. S. *General G. W. Goethals*, at New York.				
G. Amsinck & Co., Inc..	Cristobal	New York	21,600	
Ultramares Corp.	Cristobal	New York	10,200	
J. S. Sembrada & Co....	Cristobal	New York	1,515	
W. R. Grace & Co	Cristobal	New York	300	
Pablo Calvet & Co	Cristobal	New York	15,000	
Wellman, Peck & Co....	Cristobal	New York	4,800	
T. Thompson & Co	Cristobal	New York	300	
Various	Cristobal	New York	3,900	57,615
FEBRUARY 1. By the S. S. *General O. H. Ernst*, at New York.				
G. Amsinck & Co., Inc..	Cristobal	New York	3,450	
Pablo Calvet & Co	Cristobal	New York	10,800	
Otto Gerdan & Co	Cristobal	New York	66,600	80,850
FEBRUARY 1. By the S. S. *Colon*, at New York.				
G. Amsinck & Co., Inc..	Cristobal	New York	4,500	4,500
FEBRUARY 2. By the S. S. *Mayaro*, at New York.				
Middleton & Co	Trinidad	New York	4,245	4,245
FEBRUARY 9. By the S. S. *Waconta*, at New York.				
Various	Vera Cruz	New York	4,350	4,350
FEBRUARY 11. By the S. S. *Ancon*, at New York.				
Ultramares Corp.	Cristobal	New York	2,550	
G. Amsinck & Co., Inc..	Cristobal	New York	70,950	
Pablo Calvet & Co	Cristobal	New York	167,550	
J. S. Sembrada & Co...	Cristobal	New York	1,300	
Hollinghurst & Co	Cristobal	New York	1,050	
R. Fabian & Co	Cristobal	New York	600	
Isaac Brandon & Bros..	Cristobal	New York	1,050	
A. M. Capen's Sons, Inc.	Cristobal	New York	5,250	
Mecke & Co	Cristobal	New York	5,250	
Andean Trading Co....	Cristobal	New York	4,500	
Overseas Corp.	Cristobal	New York	87,450	
Otto Gerdan & Co	Cristobal	New York	38,550	
P. Nephews & Co	Cristobal	New York	450	
Demarest Bros.	Cristobal	New York	1,950	
Various	Cristobal	New York	397,480	785,930
FEBRUARY 16. By the S. S. *Panama*, at New York.				
J. S. Sembrada & Co...	Cristobal	New York	2,418	
William E. Peck & Co..	Cristobal	New York	6,150	
Wm. Scholl & Co	Cristobal	New York	19,500	
Mecke & Co	Cristobal	New York	3,750	
American Trading Co..	Cristobal	New York	300	
Heilbron, Wolff & Co...	Cristobal	New York	1,050	
Ultramares Corp.	Cristobal	New York	19,950	
Various	Cristobal	New York	11,250	64,368
FEBRUARY 19. By the S. S. *Mohegan*, at New York.				
Ultramares Corp.	Puerto C'lbia	New York	89,400	89,400
FEBRUARY 20. By the S. S. *Carillo*, at New York.				
Ultramares Corp.	Cristobal	New York	450	450
FEBRUARY 21. By the S. S. *Gen. W. C. Gorgas*, at New York.				
G. Amsinck & Co., Inc..	Cristobal	New York	7,920	
Pablo Calvet & Co	Cristobal	New York	33,300	
Various	Cristobal	New York	3,060	44,280

GUAYULE.

FEBRUARY 17. By rail at Eagle Pass, Texas.				
Continental-Mexican Rubber Co.	Mexico	New York	56,000	56,000
FEBRUARY 17. By rail at Eagle Pass, Texas.				
Continental-Mexican Rubber Co.	Mexico	Akron	55,000	55,000
FEBRUARY 19. By rail at Eagle Pass, Texas.				
Continental-Mexican Rubber Co.	Mexico	New York	68,100	68,100
FEBRUARY 28. By rail at Eagle Pass, Texas.				
Continental-Mexican Rubber Co.	Mexico	Akron	82,500	82,500

PONTIANAK.

FEBRUARY 9. By the S. S. *Maneric*, at New York.				
Edward Boustead & Co..	Singapore	New York	53,040	53,040
FEBRUARY 13. By the S. S. *City of New Castle*, at New York.				
United Malaysian Rubber Co., Ltd	Singapore	New York	223,250	
L. Littlejohn & Co., Inc.	Singapore	New York	48,750	
Hadden & Co	Singapore	New York	98,000	
F. R. Henderson & Co..	Singapore	New York	5,500	
Various	Singapore	New York	74,500	450,000
FEBRUARY 20. By the S. S. *Slavic Prince*, at New York.				
L. Littlejohn & Co., Inc.	Singapore	New York	2,700	
Various	Singapore	New York	175,200	177,900
FEBRUARY 14. By the S. S. *Elkhorn*, at San Francisco.				
United Malaysian Rubber Co., Ltd	Soerabaya	San Fran.	372,476	372,476
FEBRUARY 24. By the S. S. *Karimoen*, at New York.				
United Malaysian Rubber Co., Ltd	Soerabaya	New York	6,300	
Various	Soerabaya	New York	11,700	18,000

GUTTA PERCHA.

FEBRUARY 20. By the S. S. *Valacia*, at New York.				
Western Electric Co....	London	New York	1,200	1,200

GUTTA SIAK.

FEBRUARY 13. By the S. S. *City of New Castle*, at New York.				
United Malaysian Rubber Co., Ltd	Medan	New York	175,700	175,700
FEBRUARY 14. By the S. S. *New Castle*, at New York.				
United Malaysian Rubber Co., Ltd	Singapore	New York	447,149	622,849

MANIÇOBA.

FEBRUARY 2. By the S. S. *Rembrandt*, at New York.				
H. A. Astlett & Co....	Santos	New York	4,620	
Poel & Kelly	Santos	New York	101,420	
Hagemeyer & Brunn....	Santos	New York	8,140	
General Rubber Co.....	Santos	Kitchener	13,860	
General Rubber Co.....	Santos	Montreal	9,240	
Various	Santos	New York	251,640	388,920
FEBRUARY 16. By the S. S. *Maraval*, at New York.				
Southern Sales Corp....	Trinidad	New York	540	540

ANTWERP RUBBER ARRIVALS.

JANUARY 19. By the S. S. *Anversville*, from the Congo.

Société Anonyme Bungé (Comptoir Commercial Belgique)	*kilos* 6,332
Société Anonyme Bungé (Belgika)	8,280
Société Anonyme Bungé (Combination)	11,683
Société Anonyme Bungé	20,241
Société Coloniale Anversoise (Compagnie du Kassai)	18,940
Société Coloniale Anversoise (S. A. B.)	4,601
Various	40,295
Total	*kilos* 110,122

FEBRUARY 3, 1920. By the steamer *Matadi* from the Congo.

Bungé & Co.	*kilos* 51,224
Société Coloniale Anversoise (Chemins de Fer du Haut Congo)	9,730
Crédit Coloniale et Commercial (Kassai). (formerly L. & W. Van der Velde)	84,230
Others	10,377
Total	*kilos* 155,561

(Compiled by Grisar & Co., Antwerp.)

EXPORTS OF INDIA RUBBER MANUFACTURES AND INSULATED WIRE AND CABLE FROM THE UNITED STATES BY COUNTRIES, DURING THE MONTH OF DECEMBER, 1919.

EXPORTED TO—	Belting, Hose and Packing Value.	Boots. Pairs.	Boots. Value.	Shoes. Pairs.	Shoes. Value.	Druggists' Rubber Sundries. Value.	Tires. Automobiles. Value.	Tires. All Others. Value.	Insulated Wire and Cables. Value.	All Other Manufactures of Rubber. Value.	Totals. Value.
EUROPE:											
Austria-Hungary	$128	.....	.....	.....	.....	.....	$10,800	.....	.....	$2,477	$13,405
Azores and Madeira Islands	.....	.....	.....	.....	.....	.....	.....	.....	$22	.....	22
Belgium	1,288	2	$4	6,435	$5,525	$55	84,467	$2,656	$28,306	4,516	126,817
Denmark	27	508	4,038	76,677	53,591	30	189,939	8,453	3,468	16,657	276,203
France	1,575	33	155	30,764	24,565	10,793	208,638	8,109	11,038	55,630	320,503
Germany	43	1	4	7	13	1,200	32,719	27	.....	24	34,030
Greece	.....	.....	.....	719	818	.....	28,129	.....	1,920	3,095	33,962
Iceland and Faroe Islands	.....	1,449	2,820	24	21	50	701	.....	1,344	43	4,979
Italy	1,482	.....	.....	13,350	18,677	441	82,528	.....	13,134	6,852	123,114
Malta, Gozo and Cyprus Islands	.....	22	59	.....	.....	.....	.....	.....	.....	1,150	1,209
Netherlands	5,769	.....	.....	23,507	21,391	306	186,139	20,416	26,702	6,995	267,718
Norway	41	5,424	11,300	172,539	151,658	3,283	71,323	5,889	84,622	6,866	334,982
Portugal	50	12	78	81	64	.....	19,214	879	.....	1,254	21,539
Roumania	14	.....	.....	3,348	5,600	.....	23,972	.....	.....	80	29,666
Russia in Europe	8,400	2	12	360	253	.....	1,250	.....	2,258	209	12,382
Spain	1,541	60	300	4,068	3,310	2,278	118,981	994	16,416	16,384	160,204
Sweden	$42	.....	.....	.....	.....	.....	54,628	.....	.....	267	55,437
Switzerland	.....	48	72	64,664	41,303	130	81,461	.....	5,322	11,577	139,865
Turkey in Europe	.....	.....	.....	206,164	158,116	28	32	.....	65	600	158,841
England	60,904	2,396	4,323	68,925	45,465	16,194	340,998	44,717	17,991	106,693	637,285
Scotland	50	.....	.....	3,600	2,731	72	65	.....	.....	.....	2,918
Ireland	.....	.....	.....	.....	.....	.....	.....	.....	.....	415	415
TOTALS, EUROPE	$81,854	9,957	$23,165	675,232	$533,101	$34,860	$1,535,984	$92,140	$212,608	$241,784	$2,755,496
NORTH AMERICA:											
Bermuda	$189	9	$37	177	$148	.....	$10,326	.....	$4,405	$619	$15,724
British Honduras	4	.....	.....	2,794	2,365	.....	400	$10	185	92	3,056
Canada	$6,510	3,835	12,037	5,760	7,455	$23,225	67,412	3,843	24,995	253,040	448,517
Costa Rica	500	.....	.....	18	14	243	1,715	22	493	1,615	4,602
Guatemala	468	.....	.....	.....	.....	30	.....	24	2,570	141	3,233
Honduras	1,089	.....	.....	310	394	982	1,787	278	40	380	4,950
Nicaragua	1,346	.....	.....	916	683	202	2,810	14	332	1,967	7,354
Panama	6,326	.....	.....	144	92	865	24,589	2,540	7,707	2,175	44,294
Salvador	93	.....	.....	144	80	917	4,793	.....	245	829	6,957
Mexico	66,257	19	107	2,729	2,692	12,239	71,369	9,130	21,852	26,916	210,562
Miquelon, Langley, etc.	.....	370	647	96	63	.....	.....	.....	.....	.....	710
Newfoundland and Labrador	1,801	4,726	13,662	7,407	9,147	10	3,316	73	369	6,995	35,373
Barbados	.....	.....	.....	196	144	.....	647	.....	.....	96	887
Jamaica	532	.....	.....	360	313	61	13,825	306	404	969	16,410
Trinidad and Tobago	2,663	.....	.....	566	470	1,100	14,841	749	141	217	20,181
Other British West Indies	46	.....	.....	925	783	72	1,031	$16	201	307	2,956
Cuba	49,760	6	23	20,804	19,509	6,987	202,254	16,656	50,458	33,969	379,616
Danish West Indies	232	.....	.....	.....	.....	.....	963	8	54	280	1,537
Dutch West Indies	2,776	.....	.....	102	56	.....	217	.....	.....	66	3,115
French West Indies	142	.....	.....	53	70	15	2,138	153	210	136	2,864
Haiti	83	.....	.....	4	3	15	8,073	9	149	342	8,674
Dominican Republic	1,608	.....	.....	72	58	97	4,225	581	596	1,495	8,660
TOTALS, NORTH AMERICA	$192,425	8,965	$26,513	43,577	$44,539	$47,060	$436,731	$34,912	$115,406	$332,646	$1,230,232
SOUTH AMERICA:											
Argentina	$7,179	.....	.....	5,947	$5,923	$3,198	$41,266	$70	$10,705	$38,650	$106,991
Bolivia	1,582	.....	.....	.....	.....	95	2,250	.....	.....	105	4,032
Brazil	9,975	.....	.....	28,039	23,049	2,227	121,452	642	47,394	18,640	223,379
Chile	11,264	.....	.....	2,237	1,810	2,712	22,529	1,061	25,105	21,862	86,343
Colombia	1,059	.....	.....	171	170	1,254	14,223	559	5,189	3,809	26,263
Ecuador	.....	.....	.....	592	455	514	490	.....	328	166	1,953
British Guiana	50	.....	.....	28	22	.....	1,462	.....	58	623	2,215
Dutch Guiana	.....	.....	.....	.....	.....	.....	100	.....	.....	81	181
Paraguay	2,701	.....	.....	.....	.....	.....	.....	.....	.....	.....	2,701
Peru	6,081	.....	.....	.....	.....	170	17,756	.....	26,577	2,934	53,518
Uruguay	.....	.....	.....	250	244	359	26,536	.....	1,363	1,976	30,478
Venezuela	833	.....	.....	.....	.....	927	5,823	170	255	2,795	10,803
TOTALS, SOUTH AMERICA	$40,724	.....	.....	37,264	$31,673	$11,456	$253,887	$2,502	$116,974	$91,641	$548,857
ASIA:											
China	$323	.....	.....	6,004	$9,005	$253	$1,113	$1,026	$2,469	$2,582	$16,771
Japanese China	.....	.....	.....	.....	.....	.....	425	.....	.....	.....	425
Chosen	.....	.....	.....	343	313	.....	145	.....	.....	117	575
British India	5,027	.....	.....	858	704	1,474	93,850	4,723	16,413	8,322	130,513
Straits Settlements	1,853	.....	.....	.....	.....	156	75,387	.....	.....	6,052	83,448
Other British East Indies	665	.....	.....	.....	.....	.....	1,809	.....	615	8	3,097
Dutch East Indies	577	.....	.....	1	2	17	27,150	.....	3,669	1,709	33,124
French East Indies	.....	.....	.....	.....	.....	167	.....	270	.....	.....	437
Hongkong	38	.....	.....	221	424	.....	733	687	51	655	2,588
Japan	14,834	2,292	$5,377	33,090	33,376	47	4,353	507	13,883	17,498	89,875
Russia in Asia	.....	.....	.....	3,072	3,389	.....	.....	.....	.....	.....	3,389
Siam	.....	.....	.....	.....	.....	280	.....	.....	.....	.....	280
Turkey in Asia	.....	.....	.....	6,459	6,169	.....	156	.....	.....	635	6,960
TOTALS, ASIA	$23,317	2,292	$5,377	50,048	$53,382	$2,394	$205,121	$7,213	$37,100	$37,578	$371,482
OCEANIA:											
Australia	$22,251	.....	.....	3,818	$3,862	$3,107	$81,663	$711	$1,438	$22,584	$135,616
New Zealand	8,106	264	$1,690	197	179	1,091	82,448	4,292	443	6,166	104,415
Other British Oceania	.....	.....	.....	.....	.....	.....	.....	.....	489	131	540
French Oceania	183	.....	.....	.....	.....	.....	813	584	40	35	1,655
German Oceania	.....	.....	.....	58	79	.....	1,029	70	.....	520	1,698
Philippine Islands	2,892	.....	.....	386	700	1,867	79,968	2,653	12,274	6,393	106,747
TOTALS, OCEANIA	$33,432	264	$1,690	4,459	$4,820	$6,065	$245,921	$8,310	$14,604	$35,829	$350,671
AFRICA:											
Belgian Kongo	.....	.....	.....	.....	.....	.....	.....	.....	.....	$50	$50
British West Africa	63,261	.....	.....	.....	.....	.....	6,592	.....	.....	463	70,316
British South Africa	.....	300	1,248	1,189	1,314	1,937	68,797	2,829	2,252	18,876	97,253
British East Africa	.....	.....	.....	.....	.....	.....	1,080	.....	.....	.....	1,080
Canary Islands	.....	.....	.....	.....	.....	.....	576	.....	.....	.....	576
French Africa	449	.....	.....	.....	.....	.....	8,325	.....	.....	127	8,901
Italian	79	.....	.....	.....	.....	.....	.....	.....	.....	.....	79
Morocco	.....	.....	.....	300	255	.....	.....	.....	.....	.....	255
Portuguese Africa	.....	.....	.....	.....	.....	.....	150	125	371	55	701
Egypt	475	.....	.....	.....	.....	.....	441	.....	.....	2,964	3,880
TOTALS, AFRICA	$64,264	300	$1,248	1,489	$1,569	$1,937	$85,961	$2,954	$2,623	$22,535	$183,091
TOTALS	$436,016	21,778	$57,993	812,069	$669,084	$103,772	$2,763,605	$148,031	$499,315	$762,013	$5,439,829

SHIPMENTS TO NON-CONTIGUOUS TERRITORY.

EXPORTED TO—	Belting Hose and Packing.	Boots and Shoes. Pairs.	Boots and Shoes. Value.	Druggists' Rubber Sundries. Value.	Tires. Automobiles. Value.	Tires. All Others. Value.	Insulated Wire and Cables. Value.	All Other Manufactures of Rubber. Value.	Totals. Value.
Hawaii	$16,760	2,767	$5,149	.....	$169,075	$1,590	.....	$15,943	$208,517
Porto Rico	3,086	887	850	.....	51,840	1,172	.....	12,211	69,159
TOTALS	$19,842	3,654	$5,999	.....	$220,915	$2,762	.....	$28,154	$277,676

(Compiled by the Bureau of Foreign Commerce, Department of Commerce, Washington, D. C.)

OFFICIAL INDIA RUBBER STATISTICS FOR THE UNITED STATES.

IMPORTS OF CRUDE AND MANUFACTURED RUBBER.

	Twelve Months Ended December 31			
	1918.		1919.	
UNMANUFACTURED—*free:* India rubber:	Pounds.	Value.	Pounds.	Value.
From France	169,318	$72,406	2,410,319	$752,579
Netherlands	.....	.....	2,637,665	1,276,060
Portugal	424,424	152,362	87,422	24,470
United Kingdom	6,627,165	3,723,993	60,251,894	28,687,500
Canada	2,712,336	1,314,386	5,320,540	2,530,295
Central America	387,144	143,033	448,827	152,416
Mexico	2,185,809	850,123	963,242	306,307
Brazil	40,332,620	13,378,588	58,845,384	20,828,269
Peru	1,373,751	489,146	4,567,002	1,501,854
Other South America	2,216,993	873,914	2,398,750	1,000,962
British E. Indies	227,695,805	104,973,396	329,624,236	131,652,143
Dutch E. Indies	37,344,813	18,204,689	61,260,330	24,600,493
Other countries	4,489,130	2,202,277	7,124,810	2,507,035
Totals	325,959,308	$146,378,313	535,940,421	$215,820,383
Balata	1,547,338	$836,383	1,628,134	$937,038
Guayule	1,376,085	413,484	3,204,224	760,690
Jelutong (Pontianak)	9,932,476	683,551	18,662,702	2,213,964
Gutta percha	1,207,980	225,992	6,495,818	1,068,693
Totals	14,063,885	$2,159,410	29,990,878	$4,980,390
Rubber scrap	8,526,420	645,581	10,777,225	825,619
Totals, unmanufactured	348,549,613	$149,183,304	576,708,524	$221,626,392
Chicle (dutiable)	7,251,022	$3,917,104	9,445,538	$6,216,987
MANUFACTURED—*dutiable:*				
India ruber and gutta-percha	.....	$445,322	.....	$956,085
India rubber substitutes	.....	383,497	392,092	47,966

EXPORTS OF DOMESTIC MERCHANDISE.

MANUFACTURED—				
Automobile tires[1]	.....	$14,511,621	.....	$28,924,685
All other tires[1]	.....	755,888	.....	1,557,201
Scrap and old	2,931,929	287,883	8,291,853	808,993
Reclaimed	2,904,234	502,176	5,070,632	839,938
Belting, hose and packing[1]	.....	4,525,243	.....	6,100,460
Suspenders and garters	.....	1,185,985	.....	2,551,858
Boots[1] *pairs*	772,856	2,799,116	261,110	714,713
Shoes[1] *pairs*	1,285,110	1,584,747	5,794,488	4,551,386
Druggists' rubber sundries[1]	.....	772,539	.....	1,270,506
Insulated wire and cables[1]	.....	5,604,929	.....	8,815,212
Other rubber manufactures[1]	.....	5,762,079	.....	9,097,773
Totals manufactured	.....	$38,292,806	.....	$65,232,725
Fountain pens... *number*	161,399	$123,952	423,906	$409,517

EXPORTS OF FOREIGN MERCHANDISE.

UNMANUFACTURED—				
India rubber	6,150,755	$3,133,622	5,111,786	$2,205,629
Balata	706,185	436,252	351,477	206,118
Guayule	9,778	2,936	2,210	621
Jelutong (Pontianak)	73,868	9,756	163,034	26,875
Gutta-percha	126,731	29,015	12,655	3,611
Rubber scrap	58,574	16,032	1,870	206
Totals, unmanufactured	7,125,891	$3,627,613	5,643,032	$2,443,060
MANUFACTURED—				
India Rubber	.....	$25,901	.....	.....
Gutta-percha	.....	14,200	.....	$39,743
Totals, manufactured	.....	$40,101	.....	$39,743
Chicle	76,753	44,831	268,790	$155,239

EXPORTS OF RUBBER GOODS TO NON-CONTIGUOUS TERRITORIES OF THE UNITED STATES.

	Twelve Months Ended December 31.			
	1918.		1919.	
MANUFACTURED—	Pounds.	Value.	Pounds.	Value.
To Alaska:				
Belting, hose and packing	.....	$99,719	.....	$114,711
Boots and shoes, *pairs*	69,096	183,757	76,995	200,344
Other rubber goods	.....	62,601	.....	50,997
Totals	.....	$346,077	.....	$366,052
To Hawaii:				
Belting, hose and packing	.....	$89,207	.....	$119,180
Automobile tires	.....	963,329	.....	1,135,412
Other tires	.....	33,552	.....	38,450
Other rubber goods	.....	143,733	.....	159,886
Totals	.....	$1,228,821	.....	$1,462,928
To Porto Rico:				
Belting, hose and packing	.....	$51,058	.....	$57,212
Automobile tires	.....	812,444	.....	867,457
Other tires	.....	12,947	.....	33,742
Other rubber goods	.....	104,827	.....	196,721
Totals	.....	$981,276	.....	$1,155,132
To Philippine Islands:				
Belting, hose and packing	.....	$213,517	.....	$279,282
Boots and shoes, *pairs*	188,928	152,835	154,624	149,189
Tires	1,115,737	.....	.....	1,498,066
Other rubber goods	277,806	.....	.....	463,660
Totals	.....	$366,352	.....	$2,390,197

[1] Details of exports of domestic merchandise by countries during December are given on pages 396-397 of this issue.

RUBBER STATISTICS FOR THE DOMINION OF CANADA.

IMPORTS OF CRUDE AND MANUFACTURED RUBBER.

	November.			
	1918.		1919.	
UNMANUFACTURED—*free:*	Pounds.	Value.	Pounds.	Value.
Rubber, gutta percha, etc.:				
From United Kingdom	54,604	$24,172	779,359	$410,096
United States	155,833	56,325	197,309	86,237
Brazil	108,592	40,364	28,600	20,413
British East Indies:				
Ceylon	18,194	11,695	.....	.....
Straits Settlements	453,826	209,198	1,048,723	457,147
New Zealand	1,324	940	.....	.....
Totals	792,373	$342,694	2,053,991	$973,893
Rubber, recovered	431,759	54,003	347,521	59,178
Hard rubber sheets and rods	2,540	2,581	12,844	3,579
Hard rubber tubes	.....	950	.....	1,666
Rubber, powdered, and rubber or gutta percha scrap	61,209	13,598	354,672	44,468
Rubber thread, not covered	2,420	3,520	2,659	3,879
Rubber substitute	134,942	12,901	135,236	15,512
Totals, unmanufactured	632,870	$87,553	852,932	$128,282
Balata	20	29	1	.....
Chicle	41,812	28,852	151,203	94,767
MANUFACTURED—*dutiable:*				
Boots and shoes	.....	$15,349	.....	$36,561
Waterproofed clothing	.....	4,414	.....	17,290
Belting, hose and packing	.....	35,251	.....	32,214
Gloves, and hot-water bottles	.....	(*)	.....	4,020
Fountain pens	.....	(†)	.....	10,012
Tires	.....	35,373	.....	38,584
Insulated wire and cables:				
Wire and cables, covered with cotton, linen, silk, rubber, etc.	.....	10,233	.....	14,575
Copper wire and cables, covered as above	.....	(‡)	.....	9,779
Other manufactures	.....	151,600	.....	210,760
Totals, manufactured	.....	$222,220	.....	$373,805

EXPORTS OF DOMESTIC AND FOREIGN RUBBER GOODS.

	November.			
	1918.		1919.	
UNMANUFACTURED—	Produce of Canada. Value.	Reexports of Foreign Goods. Value.	Produce of Canada. Value.	Reexports of Foreign Goods. Value.
Crude and waste rubber	$14,654	.....	$30,273	$16,373
MANUFACTURED—				
Hose	4,624	.....	17,295	.....
Boots and shoes	84,352	$60	214,658	131
Clothing	1,141	.....	9,488	27
Tires	385,815	8,139	322,274	2,046
Belting	83	.....	245	.....
All other—n. o. p.	3,220	2,273	13,625	2,236
Totals, manufactured	$479,235	$10,472	$577,585	$4,440
Chicle	.....	.....	37,985	.....

*Included in "Other manufactures."
†Included in "Pens of all kinds."
‡Included in "Wire and cables," etc.

UNITED KINGDOM RUBBER STATISTICS.

IMPORTS.

	December. 1918. Pounds.	1918. Value.	1919. Pounds.	1919. Value.
UNMANUFACTURED—				
Crude rubber:				
From—				
Dutch East Indies	1,119	£13,676	25,088	£300,694
French West Africa	573	6,022	.....	.....
Gold Coast	2,777	26,419	480	3,156
Other African countries	12,045	100,502	3,880	33,994
Peru	1,617	21,154	216	2,510
Brazil	12,285	158,454	12,678	154,993
British India	9,956	115,880	14,908	180,042
Straits Settlements	74,454	769,154	54,204	633,641
Federated Malay States	5,245	60,870	63,520	753,366
Ceylon and dependencies	10,699	127,747	43,913	519,123
Other countries	.....	.....	6,245	72,325
Totals	130,771	£1,399,878	225,232	£2,653,844
Waste and reclaimed rubber	.....	.....	6,966	20,123
Totals, unmanufactured	130,771	£1,399,878	232,198	£2,673,967
Gutta percha	11,941	£254,072	13,057	£240,870
MANUFACTURED—				
Boots and shoes, *dozen pairs*	672	£4,907	14,096	£27,055
Waterproofed clothing	.....	.....	.....	3,809
Automobile tires and tubes	.....	47,248	.....	322,205
Motorcycle tires and tubes	.....	326	.....	3,674
Carriage tires and tubes	.....	.....	.....	771
Bicycle tires and tubes	.....	.....	.....	9,612
Insulated wire	.....	3,426	.....	447
Submarine cables	.....	.....	.....	.....
Totals	.....	£55,907	.....	£367,673

EXPORTS.

UNMANUFACTURED—				
Waste and reclaimed rubber	4,941	£9,681	9,679	£23,146
MANUFACTURED—				
Waterproofed clothing	.....	40,722	.....	242,702
Boot and shoes, *dozen pairs*	9,577	13,961	15,167	34,504
Insulated wire	.....	20,975	.....	97,487
Submarine cables	.....	106,490	.....	78,070
Carriage tires and tubes	.....	13,045	.....	19,900
Bicycle tires and tubes	.....	26,360	.....	114,386
Automobile tires and tubes	.....	79,171	.....	238,287
Motorcycle tires and tubes	.....	15,095	.....	27,909
Other rubber manufactures	.....	122,967	.....	292,851
Totals	.....	£398,786	.....	£1,146,096

EXPORTS—COLONIAL AND FOREIGN.

UNMANUFACTURED—				
Crude rubber:				
To Russia	.....	.....	101	£820
Belgium	.....	.....	7,274	77,126
France	10,806	£126,739	19,710	226,305
Italy	6,900	79,995	5,149	53,787
United States of America	.....	.....	141,320	1,707,452
Other countries	1,675	24,711	18,613	216,040
Total	19,381	£231,445	192,167	£2,281,530
Waste and reclaimed	.....	.....	879	3,222
Totals, unmanufactured	19,381	£231,455	193,046	£2,284,752
Gutta percha	.....	.....	2,869	£51,207
MANUFACTURED—				
Boots and shoes, *dozen pairs*	461	£893	143	£4,871
Waterproof clothing	.....	.....	.....	34
Insulated wire	.....	.....	.....	.....
Automobile tires and tubes	.....	3,307	.....	1,656
Motorcycle tires and tubes	.....	.....	.....	87
Bicycle tires and tubes	.....	56	.....	.....
Totals	.....	£4,256	.....	£6,648

THE MARKET FOR RUBBER SCRAP.

NEW YORK.

THERE has been a steady demand for shoe and tire scrap from the reclaimers who are operating at capacity in most standard grades.

The price of shoes is somewhat easier than last month. The unusually heavy snow of the past month has depleted stocks of rubber footwear and this enormous consumption of new goods will have a marked effect in increasing the spring collections. The spring collection of tires is due in two months and will be of larger than usual proportions.

The price of crude is but slightly affecting that of scrap

The most important factor in the scrap rubber market has been the difficulty of making shipments. The heavy weather has embargoed practically all consuming points. Dealers thus being unable to move their stocks freely either inward or outward. This situation has resulted in lower price offerings by the dealers.

Figures compiled by the National Automobile Chamber of Commerce indicate that the scrap tires produced in 1920 will total a net rubber content of 96,000 tons, scrap tubes for 1920 will net 20,000 tons, a total of 116,000 tons rubber scrap resulting from 1920 expansion in the automobile industry. Some dealers look with concern upon this output while others optimistically consider it affords an opportunity for them to do a bigger business than ever, possibly on a new scale of prices.

QUOTATIONS FOR CARLOAD LOTS DELIVERED.

February 25, 1920.

Prices subject to change without notice.

BOOTS AND SHOES:			
Arctic tops	*lb.*	$0.01 @	
Boots and shoes	*lb.*	.08¾ @	.08½
Trimmed arctics	*lb.*	.06¾ @	.07
Untrimmed arctics	*lb.*	.05¾ @	.06
HARD RUBBER:			
Battery jars, black compound	*lb.*	.01 @	
No. 1, bright fracture	*lb.*	.23 @	.24
INNER TUBES:			
No. 1, old packing	*lb.*	.18 @	.18½
No. 2	*lb.*	.10 @	.10¼
Red	*lb.*	.09½ @	.09¾
MECHANICALS:			
Black scrap, mixed, No. 1	*lb.*	.03½ @	.04
No. 2	*lb.*	.03 @	
Car springs	*lb.*	.03½ @	.04
Heels	*lb.*	.03 @	.03½
Horse-shoe pads	*lb.*	.03 @	.03½
Hose, air brake	*lb.*	.04¼ @	
fire, cotton lined	*lb.*	.01½ @	.01¾
garden	*lb.*	.01½ @	.01¾
Insulated wire stripping, free from fiber	*lb.*	.03½ @	.04
Matting	*lb.*	.01¼ @	.01½
Red packing	*lb.*	.05½ @	.06
Red scrap, No. 1	*lb.*	.09 @	.10
No. 2	*lb.*	.06¾ @	.07¼
White scrap No. 2	*lb.*	.08 @	.09
No. 1	*lb.*	.10 @	.11
TIRES:			
PNEUMATIC—			
Auto peelings, No. 1	*lb.*	.06¾ @	.07¾
No. 2	*lb.*	.04¾ @	.05¼
Bicycle	*lb.*	.02¾ @	.03
Standard white auto	*lb.*	.04½ @	.04¾
Standard mixed auto	*lb.*	.03¾ @	
Stripped, unguaranteed	*lb.*	.02¾ @	
White, G. & G., M. & W., and U. S.	*lb.*	.04¾ @	.05
SOLID—			
Carriage	*lb.*	.04 @	.04¼
Irony	*lb.*	.01 @	
Truck	*lb.*	.03½ @	.03¾

THE MARKET FOR COTTON AND OTHER FABRICS.

NEW YORK.

AMERICAN COTTON. Though the variations in prices amounted to 255 points, the market for cotton remained extraordinarily dull throughout February, "no sales" being recorded day after day for three weeks. On February 2, the spot price for middling uplands cotton was 39.50 cents; it declined day by day to 37.55 cents, rose slightly and hung around 38 cents for a week, then rose slowly to 39.35 cents on February 24 and 40.10 cents on February 25.

EGYPTIAN COTTON. The market for Egyptian cotton has been rather erratic, with violent fluctuations, but this has not seriously affected the actual sales. Conditions are much as they were last month, though prices have gone up somewhat. High grade Sakel is worth $1.50 a pound and upper Egypts 8 or 10 cents a pound less.

ARIZONA COTTON. This is selling now at $1.00 a pound for medium grades and little of it is to be had. The number of bales on hand is less than 3,000. The quality of the Arizona cotton makes it more desirable for the purposes of American manufacturers than the Egyptian. It has been figured that the

world's supply of long staple cotton will not fill the demands of the tire manufacturers.

SEA ISLAND COTTON. So little of this is left that it may as well be left out of account; it does not amount to more than 3,000 bales. Some has been sold recently at $1.00 a pound for selected average extra choice. Some mills have given up Sea Island entirely and turned to Egyptian.

DUCKS AND DRILLS. The demand has been active and manufacturers have had nothing to offer for prompt delivery.

RAINCOAT CLOTH. The advanced prices in the raincoat trade have been maintained during the month. There has been little or no change in the market and there is absolutely no demand for the goods at the prices asked.

SHEETINGS. While buying during the past two weeks has slackened up very materially, prices have not weakened to any extent. Goods from mills are still hard to obtain.

TIRE FABRICS. The conditions existing since last fall continue and are not likely to change. The product of the mills has been sold out for the whole of 1920. Only futures are offered at absurdly high prices. Some tire manufacturing companies are selling the tire fabrics they have bought at a profit, instead of making tires themselves.

NEW YORK QUOTATIONS.

FEBRUARY 25, 1920.

Prices subject to change without notice.

ASBESTOS CLOTH:			
Brake lining, 2½ lbs. sq. yd., brass or copper insertion ..... *lb.*	$1.00	@	1.10
2¾ lbs. sq. yd., brass or copper insertion ..... *lb.*	1.10	@	1.15
BURLAPS:			
32—7-ounce ..... 100 *yards*	10.50	@	
32—8-ounce	11.00	@	
40—7½-ounce	11.65	@	
40—8-ounce	11.75	@	
40—10-ounce	17.00	@	
40—10½-ounce	17.25	@	
45—7½-ounce	15.25	@	
45—8-ounce	15.50	@	
48—10-ounce	22.00	@	
DRILLS:			
38-inch 2.00-yard ..... *yard*	.43½	@	
40-inch 2.47-yard	.35¼	@	
52-inch 1.90-yard	.55¼	@	
52-inch 1.95-yard	.53⅞	@	
60-inch 1.52-yard	69¼	@	
DUCK:			
CARRIAGE CLOTH:			
38-inch 2.00-yard enameling duck ..... *yard*	.46	@	
38-inch 1.74-yard	.52¾	@	
72-inch 16.66-ounce	1.20¾	@	
72-inch 17.21-ounce	1.23¾	@	
MECHANICAL:			
Hose ..... *pound*	.76	@	
Belting	.76	@	
HOLLANDS, 40-INCH:			
Acme ..... *yard*		@	
Endurance		@	
Penn		@	
OSNABURGS:			
40-inch 2.35-yard ..... *yard*	*.37½	@	
40-inch 2.48-yard	*.35½	@	
37½-inch 2.42-yard	*.36½	@	
RAINCOAT FABRICS:			
COTTON:			
Bombazine 64 x 60 ..... *yard*	.29	@	
60 x 48	.26	@	
Cashmeres, cotton and wool, 36-inch, tan	1.20	@	
Twills 64 x 72	.46	@	
64 x 102	.48	@	
Twill, mercerized, 36-inch, blue and black	.67½	@	
tan and olive	.65	@	
Tweed	.90	@	1.00
printed	.27½	@	
Plaids 60 x 48	.27	@	
56 x 44	.26	@	
Repp	.45	@	.50
Surface prints 60 x 48	.28	@	
64 x 60	.30	@	
IMPORTED WOOLEN FABRICS SPECIALLY PREPARED FOR RUBBERIZING—PLAIN AND FANCIES:			
63-inch, 3¼ to 7½ ounces ..... *yard*	1.45	@	3.90
36-inch, 2¾ to 5 ounces	.85	@	2.25
IMPORTED PLAID LINING (UNION AND COTTON):			
63-inch, 2 to 4 ounces ..... *yard*	.95	@	1.90
36-inch, 2 to 4 ounces	.60	@	1.15
DOMESTIC WORSTED FABRICS:			
36-inch, 4½ to 8 ounces ..... *yard*	.85	@	1.90
DOMESTIC WOVEN PLAID LININGS (COTTON):			
36-inch, 3¼ to 5 ounces	.27	@	.35
SHEETINGS, 40-INCH:			
48 x 48, 2.35-yard ..... *yard*	.36	@	
48 x 48, 2.50-yard	.34	@	
48 x 48, 2.70-yard	.32	@	
48 x 48, 2.85-yard	.31	@	
64 x 68, 3.15-yard	.33	@	
56 x 60, 3.60-yard	.30	@	
SILKS:			
Canton, 38-inch ..... *yard*	.75	@	
Schappe, 36-inch	1.00	@	
STOCKINETTES:			
SINGLE THREAD:			
3½ Peeler, carded ..... *pound*		@	
4½ Peeler, carded	1.15¼	@	1.15¾
6½ Peeler, combed		@	
DOUBLE THREAD:			
Zero Peeler, carded ..... *pound*	.98¼	@	.98½
3½ Peeler, carded	1.04¼	@	1.04½
6½ Peeler, combed	2.70¼	@	2.70½
TIRE FABRICS:			
BUILDING:			
17¼-ounce Sakellarides, combed ..... *pound*	*2.90	@	
17¼-ounce Egyptian, combed	*2.45	@	2.50
17¼-ounce Egyptian, carded	*2.30	@	2.35
17¼-ounce Peelers, combed	*2.25	@	2.35
17¼-ounce Peelers, carded	*1.45	@	1.50
CHAFER:			
9¼-ounce Sea Island ..... *pound*		@	
9¼-ounce Egyptian, carded	*2.80	@	
9¼-ounce Peeler, carded	*1.75	@	

*Nominal.

SEA ISLAND CROP MOVEMENT.

FROM AUGUST 1, 1919, TO JANUARY 30, 1920.

	Receipts. 1919-20.	1918-19.
Stock on hand, August 1, 1919—		
Savannah, 4,901; Charleston, 90.....bales	4,991	15,764
Received at Savannah (gross).....	5,968	8,951
Received at Charleston.....	2,643	6,753
Received at Jacksonville.....	9,377	6,636
Received at Brunswick.....	.....	.....
Received at Norfolk.....	.....	.....
Total	22,979	38,104
Less exports	20,117	22,836
Stock January 30, 1920—		
Savannah, 1,539; Charleston, 1,323.....	2,862	15,268
Crop in sight at all ports to date.....	17,988	22,340

EXPORTS.

	To Great Britain.	Continent.	North Mills.	South Mills.	Totals.
From—					
Savannah	...	238	7,707	1,385	9,330
Charleston	...	.....	1,410	.....	1,410
Jacksonville	...	.....	9,377	.....	9,377
Brunswick	...	.....	.....	.....	.....
Norfolk	...	.....	.....	.....	.....
Total	...	238	18,494	1,385	20,117
1918-19	188	.....	21,920	728	22,836
	*188	†238	*3,426	†657	†2,719

*Decrease. †Increase.
(Compiled by John Malloch & Co., Savannah, Georgia.)

EGYPTIAN COTTON CROP MOVEMENT.

FROM AUGUST 1, 1919, TO DECEMBER 24, 1919.

	1919-1920.	1918-1919.	1917-1918.
To Liverpool .....bales	159,793	110,440	101,873
Manchester	87,116	62,674	29,111
Other United Kingdom ports.....	145	5,537	17,152
Total shipments to Great Britain.....	247,054	178,651	148,136
To France	21,240	2,318	10,309
Spain	5,730	10,140	1,484
Italy	10,819	23,733	14,954
Belgium	230	.....	.....
Switzerland	6,690	3,116	.....
Holland	190	.....	.....
Portugal	300	.....	.....
Germany	150	.....	.....
Austria	4,943	.....	.....
Greece	104	3,713	.....
Turkey and other countries.....	73	.....	.....
Total shipments to Continent.....	50,469	43,020	26,747
To United States	120,129	11,792	13,530
Japan	8,745	5,520	10,014
Total shipments to all parts.....	426,397	238,983	198,427
Total crop (interior gross weight), cantars[1].	4,826,342		6,315,841

[1]One cantar equals 98 pounds.
(Compiled by Davies, Benachi & Co.)

THE MARKET FOR CHEMICALS AND COMPOUNDING INGREDIENTS.

NEW YORK.

THE GENERAL CONDITION of short supply continues unrelieved in most lines as was reported for January. Labor, fuel and transportation are the controlling factors in this situation which will become readjusted slowly to the needs of industry generally.

ANILINE OIL. There is very little spot being offered; price 32 to 34 cents per pound.

BARYTES. There is considerable uncertainty in the production situation as regards labor, fuel, etc., which is reflected in limited nearby offerings at $23 to $25 per ton.

BENZOL. The pure grade is quoted at 27 cents and 90 per cent at 23 cents per pound.

DRY COLORS. Prices generally have been firm and latterly in the month were advanced to new levels.

LITHARGE. Production is keeping pace with demand. Prices are very firm with labor cost rising.

LITHOPONE. Output sold far ahead. There is very little spot stock and none for contracts. The price is 7¼ to 7½ cents per pound.

SUBLIMED LEAD. The high price of pig lead has resulted in very firm prices for lead products. The demand for sublimed lead is beyond production capacity.

SULPHUR. There is steady demand at firm prices which remained unchanged the past month.

WHITING. There has been a persistent shortage of chalk importation curtailing output and supporting high firm prices for whiting.

ZINC OXIDE. The demand surpasses all records and production costs are mounting. The various grades are sold well ahead. The item of cooperage is a strong factor in the present high prices.

NEW YORK QUOTATIONS.

FEBRUARY 25, 1920.

Prices subject to change without notice.

ACCELERATORS, ORGANIC.				
Accelerator, N. C. C.	lb.	$0.50	@	
Accelerene, New York	lb.	4.75	@	
Accelemal	lb.	.55	@	
Aldehyde ammonia crystals	lb.	1.28	@	1.38
Aniline oil	lb.	.32	@	.35
Excellerex	lb.	.65	@	.75
Hexamethylene tetramine (powdered)	lb.	1.05	@	1.40
Paraphenylenediamine	lb.	2.50	@	3.00
Thiocarbanilide	lb.	.55	@	
Velosan	lb.	3.00	@	
ACCELERATORS, INORGANIC.				
Lead, dry red (bbls.)	lb.	.11¼	@	
sublimed blue (bbls.)	lb.	.09½	@	
sublimed white (bbls.)	lb.	.09¼	@	
white, basic carbonate (bbls.)	lb.	.10	@	
Lime, flour	lb.	.02½	@	.02½
Litharge, domestic	lb.	.11½	@	
sublimed	lb.	.11½	@	
imported	lb.	.11½	@	.12½
Magnesium, carbonate	lb.	.12	@	.13
calcined heavy	lb.	.07	@	.09
extra light	lb.	.65	@	
light	lb.	.35	@	
medium light	lb.	.30	@	
Magnesium oxide (extra light)	lb.	*.63	@	
commercial	lb.	.23	@	
Magnesite, calcined	lb.	.04	@	
ACIDS				
Acetic, 28 per cent (bbls.)	cwt.	2.75	@	3.00
glacial, 99 per cent (carboys)	cwt.	12.00	@	12.50
Cresylic (97% straw color) (drums)	gal.	.95	@	1.00
(95% dark) (drums)	gal.	.85	@	.95
Muriatic, 20 degrees	cwt.	1.75	@	2.00
Nitric, 36 degrees	cwt.	6.00	@	6.50
Sulphuric, 66 degrees	ton	20.00	@	
ALKALIES				
Caustic soda, 76 per cent (bbls.)	lb.	.04½	@	.05½
Soda ash (bbls.)	lb.	.03½	@	
COLORS.				
Black:				
Bone, powdered	lb.	.06	@	
granulated	lb.	.11	@	
Carbon black (sacks, factory)	lb.	.19	@	.20
Drop	lb.	.09	@	.10
Ivory black	lb.	.09	@	.10
Lamplack	lb.	.15	@	
Oil soluble aniline	lb.	1.25	@	
Rubber black	lb.	.08½	@	
Blue:				
Cobalt	lb.	.25	@	.35
Prussian	lb.	.90	@	
Ultramarine	lb.	.18	@	.40
Brown:				
Iron oxide	lb.	.03	@	.04
Sienna, Italian, raw and burnt	lb.	.05¼	@	.15
Umber, Turkey, raw and burnt	lb.	.05½	@	.07½
Vandyke	lb.	.02½	@	.03½
Green:				
Chrome, light	lb.	.39	@	.50
medium	lb.	.40	@	.50
dark	lb.	.60	@	
commercial	lb.	.15	@	
Oxide of chromium (casks)	lb.	.75	@	.90
Red:				
Antimony, crimson, sulphuret of (casks)	lb.	.48	@	
crimson, "Mephisto" (casks)	lb.	.60	@	
crimson, "R. M. P."	lb.	.60	@	
Antimony, golden sulphuret of (casks)	lb.	.20	@	
golden sulphuret (States)	lb.	*.30	@	.35
golden, "Mephisto" (casks)	lb.	.33	@	
golden, "R. M. P."	lb.	.33	@	
red sulphuret (States)	lb.	*.25	@	
vermilion sulphuret	lb.	.55	@	
Arsenic, red sulphide	lb.	.18	@	
Indian	lb.	.14	@	
Red excelsior	lb.	.12	@	
Toluidine toner	lb.	4.00	@	
Iron oxide, reduced grades	lb.	.14	@	
pure bright	lb.	.16	@	

Spanish	lb.	$0.04½	@	$0.06
Venetian	lb.	.02½	@	.05
Oil soluble aniline, red	lb.	2.00	@	
orange	lb.	1.75	@	
Oximony	lb.	.18	@	
Vermilion, American	lb.	.25	@	.30
artificial	lb.	.35	@	
English quicksilver	lb.	1.55	@	1.75

White:

Aluminum bronze, C. P.	lb.	.51	@	
superior	lb.	.55	@	
Lithopone, domestic	lb.	.07¾	@	.08½
Ponolith (carloads, factory)	lb.	*.07	@	.07¼
Rubber-makers' white	lb.	.11¼	@	
Zinc oxide, Horsehead (less carload, factory):				
"XX red"	lb.	.10	@	
"Special"	lb.	.10	@	
French process, red seal	lb.	.11¼	@	
green seal	lb.	.12¾	@	
white seal	lb.	.13¾	@	
(States)	lb.	*.08½	@	
Azo, ZZZ, lead free (carload factory)	lb.	.09½	@	.10
ZZ, under 5% leaded (carload factory)	lb.	.09	@	.09½
Z, 8-10% leaded (carload factory)	lb.	.08¼	@	.08¾

Yellow:

Cadmium, sulphide, yellow, light, orange	lb.	2.00	@	
red	lb.	1.85	@	
Chrome, light and medium	lb.	.30	@	
Ochre, domestic	lb.	.03	@	.07
imported	lb.	.05	@	.07½
Oil, soluble aniline	lb.	2.00	@	
Zinc chromate	lb.	.40	@	

COMPOUNDING INGREDIENTS.

Aluminum flake	ton		@	
silicate	ton	25.00	@	35.00
Ammonia carbonate, powdered	lb.	.17¾	@	
Asbestine (carloads)	ton	25.00	@	28.00
Asbestos (bags)	ton	*35.00	@	
Avoilas compound	lb.	.16	@	
Barium, carbonate, precipitated	ton	85.00	@	
sulphide, precipitated	lb.	.07	@	
dust	ton	95.00	@	
Barytes, pure white	ton	32.50	@	40.00
Barytes, off color	ton	22.50	@	
uniform floated	ton	37.50	@	40.00
Basofor	lb.	.05	@	
Blanc fixe	lb.	.04½	@	
Bone ash	lb.	.10	@	
Carrara filler	ton	25.00	@	
Chalk, precipitated, extra light	lb.	.05	@	.05½
heavy	lb.	.04	@	.04½
Blue Ridge	ton	20.00	@	
China clay, Dixie	ton	20.00	@	
domestic	ton	18.50	@	20.00
imported	ton	18.00	@	23.50
Shawnee	ton	20.00	@	
Cotton linters, clean mill run, f. o. b. factory	lb.	.04½	@	
Fossil flour (powdered)	ton	65.00	@	70.00
(bolted)	ton	75.00	@	80.00
Diatomite	lb.	.03	@	
Glue, high grade	lb.	.35	@	.40
medium	lb.	.30	@	.35
low grade	lb.	.20	@	.25
Graphite, flake (400-pound bbl.)	lb.	.10	@	.30
amorphous	lb.	.04	@	.08
Ground glass FF. (bbls.)	lb.	.03	@	
Infusorial earth (powdered)	ton	65.00	@	70.00
(bolted)	ton	75.00	@	80.00
Liquid rubber	lb.	.18	@	
Mica, powdered	lb.	.08½	@	.09
Fumice stone, powdered (bbl.)	lb.	.05	@	
Rotten stone, powdered	lb.	.02½	@	.04½
Rubber paste	lb.	.18	@	
Rub-R-Glu	lb.	*.20	@	.25
Silex (silica)	ton	22.00	@	40.00
Starch, powdered corn (carload, bbls.)	cwt.	5.34	@	
(carload, bags)	cwt.	5.12	@	
Talc, powdered soapstone	ton	18.00	@	25.00
Tripoli earth, air-floated	ton	50.00	@	52.00
Tyre-lith	ton	85.00	@	
Whiting, Alba (carloads)	cwt.	.80	@	.90
Columbia	cwt.	.80	@	
commercial	cwt.	1.50	@	
English cliffstone	cwt.	2.00	@	
gilders	cwt.	1.60	@	
Paris, white, American	cwt.	1.75	@	
Quaker	ton	16.00	@	
Super pure	ton	30.00	@	
Wood pulp, imported	lb.	.03¾	@	
Wood flour, American	lb.	.02	@	

MINERAL RUBBER.

Elateron	ton	55.00	@	60.00
Gilsonite	ton	60.00	@	65.00
Genasco (carloads, factory)	ton	55.00	@	
(less carloads, factory)	ton	57.00	@	
Hard hydrocarbon	ton	$35.00	@	
K-X	ton	30.00	@	
K. M. R.	ton	50.00	@	80.00
M. R. X.	ton	100.00	@	
Pioneer, carload, factory	ton	50.00	@	
less carload, factory	ton	57.00	@	
Raven M. R.	ton	50.00	@	70.00
Refined Elaterite	ton	175.00	@	
Richmond	ton	75.00	@	
No. 64	ton	44.00	@	
318/320 M. P. hydrocarbon	ton	50.00	@	80.00
Robertson, M. R. Special (carloads, factory)	ton	70.00	@	
M. R. (carloads, factory)	ton	55.00	@	57.50
Walpole rubber flux (factory)	lb.	.05	@	

OILS.

Castor, No. 1, U. S. P.	lb.	.21	@	
No. 3, U. S. P.	lb.	.20	@	
Corn, refined Argo	cwt.	23.56	@	
Cotton	lb.	.20	@	
Glycerine (98 per cent)	lb.	.27	@	.29
Glycerole	lb.	.55	@	
Linseed, raw (carloads)	gal.	1.77	@	
Linseed compound	gal.	.85	@	
Palm (Niger)	lb.	.17	@	.18
Peanut	lb.	.27	@	
Petrolatum	lb.	.06	@	.07
Petroleum grease	lb.	.04¾	@	
Pine, steam distilled	gal.	1.65	@	
Rapeseed, refined	lb.	.22	@	
blown	lb.	.22	@	
Rosin	gal.	.68	@	
Soya bean	lb.	.19	@	
Tar	gal.	.36	@	

RESINS AND PITCHES.

Balsam, fir	gal.	2.00	@	
Cantella gum	lb.	.55	@	
Tar, retort	bbl.	15.25	@	
kiln	bbl.	14.75	@	
Pitch, Burgundy	lb.	.09	@	
coal tar	lb.	.01	@	
pine tar	lb.	.04	@	
ponto	lb.	.14	@	
Rosin	bbl.	16.95	@	21.75
granulated	lb.		None	
fused			None	
Rosin, K	bbl.	21.00	@	
Shellac, fine orange	lb.	1.65	@	1.75

SOLVENTS.

Acetone (98.99 per cent drums)	lb.	.16	@	
methyl (drums)	gal.	1.15	@	
Benzol, water white	gal.	.25	@	.29
Beta-naphthol, resublimed	lb.	1.05	@	1.10
ordinary grade	lb.	.53	@	
Carbon bisulphide (drums)	lb.	.05¾	@	.07
tetrachloride (drums)	lb.	.10½	@	.13
Naphtha, motor gasoline (steel bbls.)	gal.	.26½	@	
72 @ 76 degrees (steel bbls.)	gal.	.36½	@	
68 @ 70 degrees (steel bbls.)	gal.	.33½	@	
V. M. & P. (steel bbls.)	gal.	.25½	@	
Toluol, pure	gal.	.28	@	.32
Turpentine, spirits	gal.	1.92	@	
wood	gal.	1.60	@	
Osmaco reducer	gal.	.35	@	
Xylol, pure	gal.	.35	@	.45
commercial	gal.	.35	@	.40

SUBSTITUTES.

Black	lb.	.10	@	.22
White	lb.	.10	@	.24
Brown	lb.	.15	@	.23
Brown factice	lb.	.12	@	.23
White factice	lb.	.13	@	.25
Paragol, soft and medium (carloads)	cwt.	18.58	@	
hard	cwt.	18.08	@	

VULCANIZING INGREDIENTS.

Lead, black hyposulphite (Black Hypo)	lb.	.39	@	
Orange mineral, domestic	lb.	.14¼	@	
Sulphur chloride (drums)	lb.	.07	@	
Sulphur, flour, Brooklyn brand (carloads)	cwt.	3.40	@	
Bergenport brand (carloads)	cwt.	3.40	@	
superfine (carloads, factory)	cwt.	2.00	@	

(See also Colors—Antimony.)

WAXES.

Wax, beeswax, white	lb.	.66	@	.68
ceresin, white	lb.	.15	@	.16
carnauba	lb.	.46	@	.90
ozokerite, black	lb.	.60	@	.65
green	lb.	.75	@	.80
Montan	lb.	.20	@	.32
substitute	lb.		None	
paraffine, refined 118/120 m. p. (cases)	lb.	.10	@	
123/125 m. p. (cases)	lb.	.10½	@	
128/130 m. p. (cases)	lb.	.11¼	@	

*Nominal.

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